ORDER NO. KM40104789C1
F1

Service Manual

Telephone Equipment

(Handset) (Base Unit)

KX-TG2503CF

2.4GHz Cordless Phone

Blue Version

(for Canada)

SPECIFICATIONS

	Base Unit	Handset
Power Source:	AC Adaptor (PQLV1Z)	Rechargeable Ni-cd battery
Receiving Frequency:	13 channels within 2.4540~2.4720 GHz	13 channels within 2.454~2.472 GHz
Receiving Method:	Direct conversion	Direct conversion
Transmitting Frequency:	13 channels within 2.4540~2.4720 GHz	13 channels within 2.454~2.472 GHz
Oscillation Method:	PLL synthesizer	PLL synthesizer
Tolerance of OSC Frequency:	24 MHz ± 720 Hz	24 MHz ± 720 Hz
Modulation Method:	NA (FSK/SS)	NA (FSK/SS)
Spread spectrum Method:	Direct sequence	Direct sequence
Chip rate	15 chip	15 chip
ID Code:	22-bit	22-bit
Dial Mode:		Tone (DTMF)/Pulse
Redial:		Up to 32 digits
Speed Dialer:		Up to 48 digits
Power Consumption:		11 days at Standby, 4.5 hours at Talk (maximum)
Dimension (H × W × D):	$2^{9}/_{16}$" × $6^{1}/_{2}$" × 8" (65 × 165 × 203 mm)	$1^{15}/_{32}$" × $2^{9}/_{32}$" × $9^{11}/_{32}$" (37 × 58 × 237 mm)
Weight	0.74 lbs. (335 g)	0.70 lbs. (319 g)

Design and specifications are subject to change without notice.

Panasonic

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you mention the serial number, write down all 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

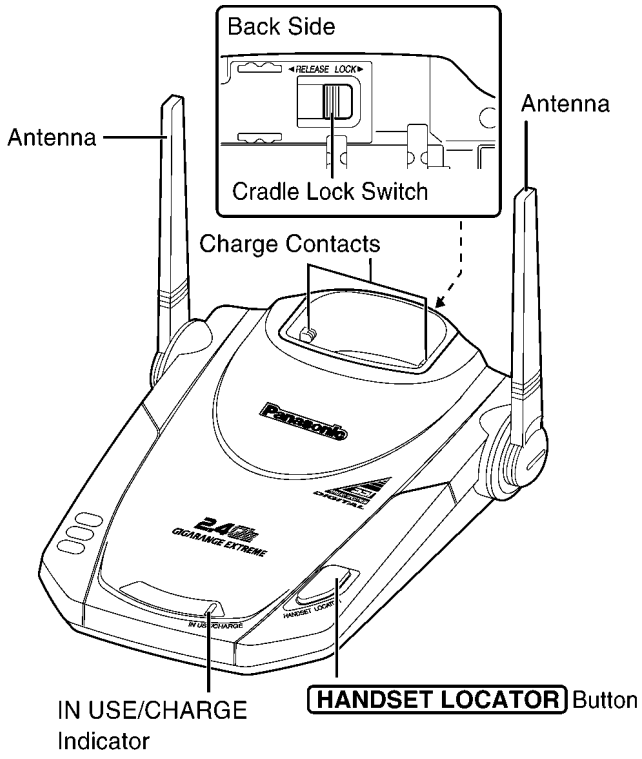
FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When replacing, the following precautions will help prevent recurring malfunctions.
1. Cover the plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the work table.
4. Do not grasp IC or LSI pins with bare fingers.

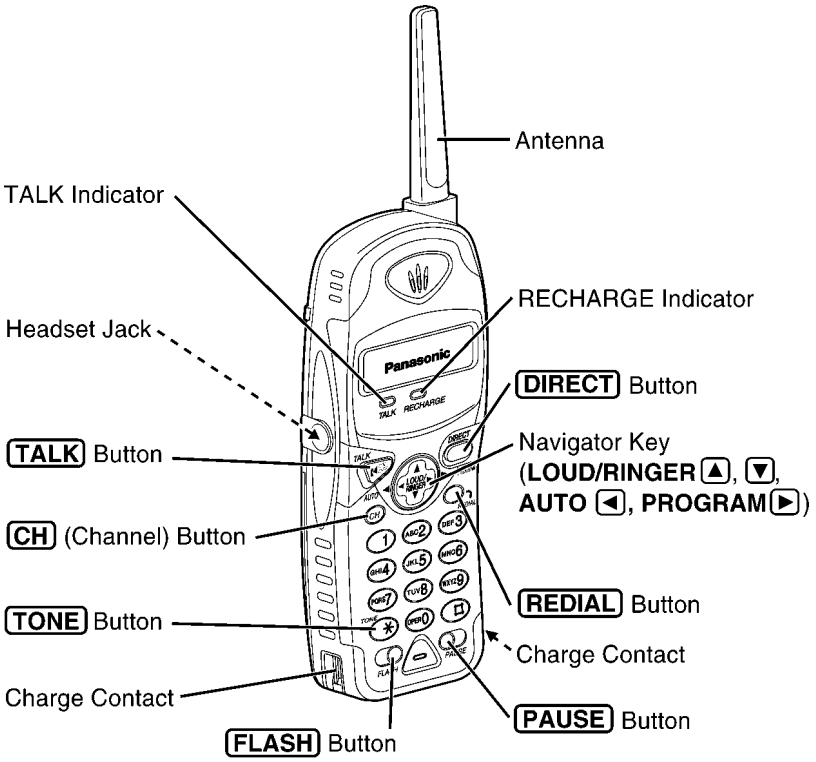
CONTENTS

1 LOCATION OF CONTROLS

1.1. Base Unit

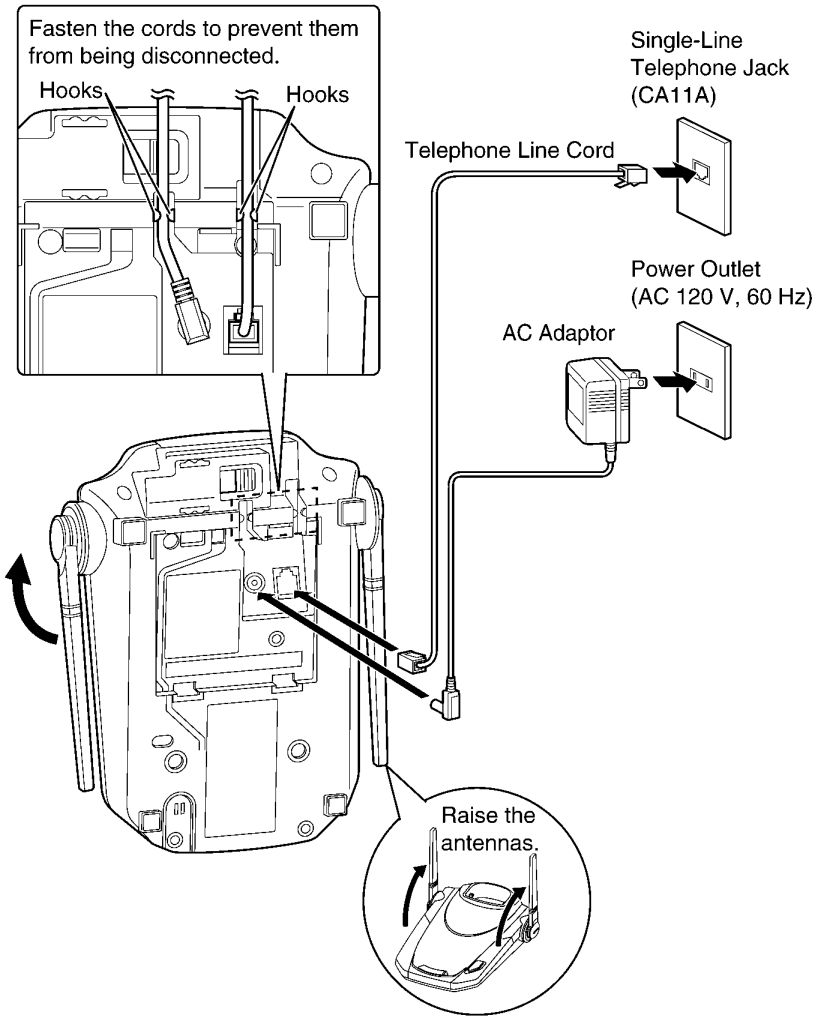


1.2. Handset



2 SETTINGS

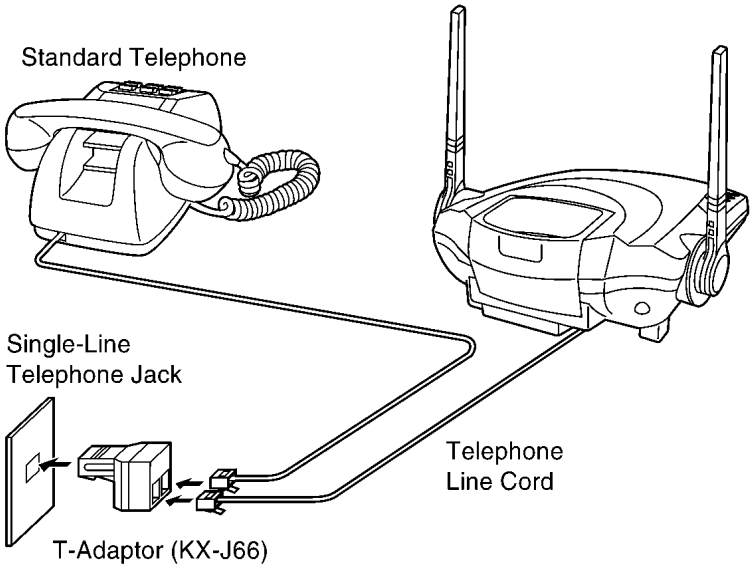
2.1. Connections



- USE ONLY WITH Panasonic AC ADAPTOR PQLV1Z.
- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)

2.2. Adding Another Phone

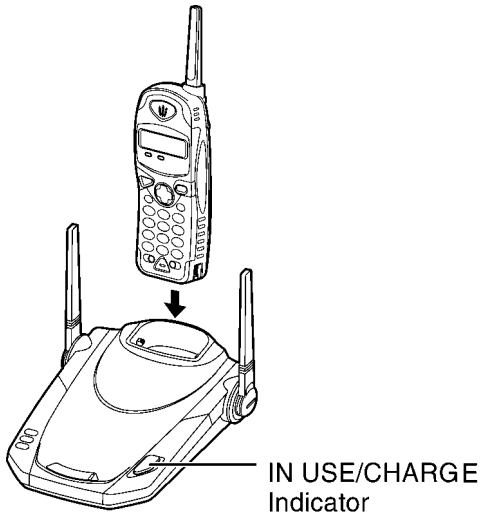
This unit will not function during a power failure. To connect a standard telephone on the same line, use the Panasonic T-adaptor KX-J66.



2.3. STANDARD BATTERY LIFE

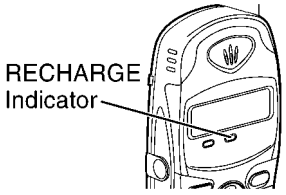
2.3.1. Battery Charge

Place the handset on the base unit and charge for about **6 hours** before initial use.
• The IN USE/CHARGE indicator lights.



2.3.2. Recharge

When the RECHARGE indicator flashes or the unit beeps intermittently, place the handset on the base unit to recharge the battery for 6 hours.
• If you DO NOT recharge the handset battery for more than 15 minutes, the RECHARGE indicator will continue to flash.



2.3.3. Battery information

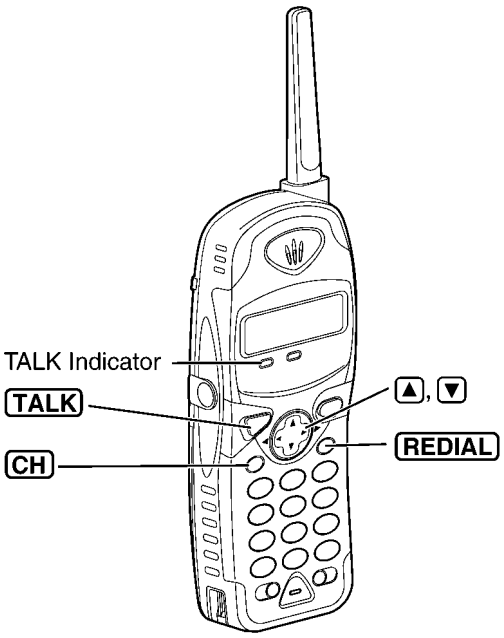
After your Panasonic battery is fully charged:

Operation		Approx. battery life
While in use (TALK)	near the base unit*	Up to 4.5 hours
	away from the base unit	Up to 3.5 hours
While not in use (Standby)		Up to 11 days

*Within about 10 feet (3 m)
•Battery life may vary depending on usage conditions and ambient temperature.
•**Clean the handset and the base unit charge contacts with a soft dry cloth.**
Clean if the unit is subject to grease, dust or high humidity. Otherwise, the battery may not charge properly.
•If the battery is fully charged, you do not have to place the handset on the base unit until the RECHARGE indicator flashes. This will maximize the battery life.
•The battery cannot be overcharged.

3 OPERATION

3.1. Making Calls



1 Press TALK.
- The TALK indicator lights.

2 Dial a phone number.

3 To hang up, press TALK or place the handset on the base unit.

To redial the last number dialed

Press TALK ➡ REDIAL.

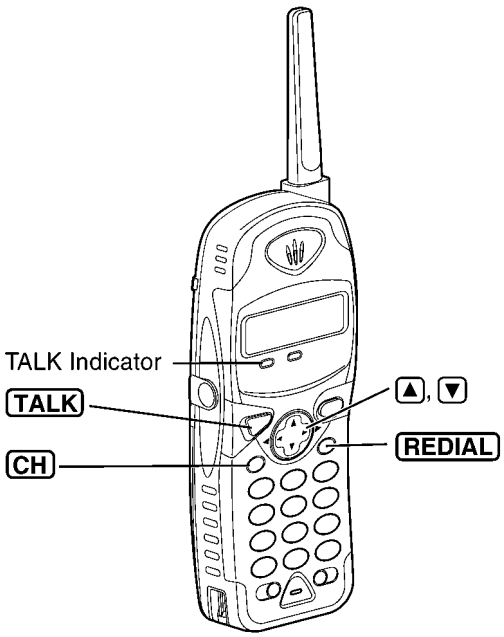
To select the receiver volume

3 levels (HIGH, MEDIUM, LOW) are available.
Press ▲ or ▼ while talking.
- Each time you press ▲ or ▼, the volume level will change.

If noise interferes with the conversation

Press CH to select a clearer channel or move closer to the base unit.

3.2. Answering Calls



If the handset is off the base unit, press TALK.
- You can also answer a call by pressing any dialing button 0 to 9, * or # (— **Any Key Talk**).

OR

If on the base unit, just lift up.

Selecting the ringer volume

The TALK indicator light must be off.

- **To select HIGH (preset) or LOW,** press ▲ or ▼.
  Each time you press ▲ or ▼, the ringer volume will change and the selected volume will ring.
- **To turn the ringer OFF,** press and hold ▼ until 2 beeps sound.
- **To turn the ringer ON,** press ▲.
  The ringer will sound at the HIGH level.
- When you replace the battery, the selected ringer volume setting will return to the factory set.

To select the dialing mode TONE (preset) or PULSE

You can program the dialing mode **using the handset near the base unit. The TALK indicator light must be off before programming.**

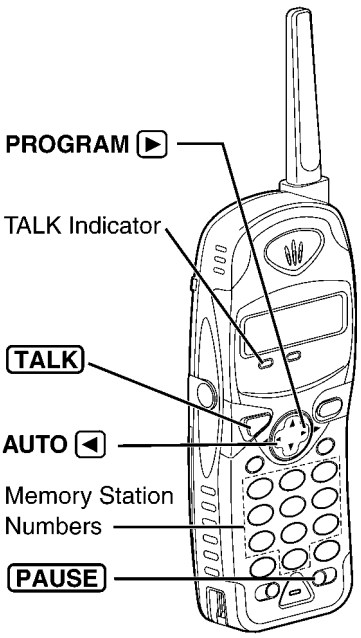
Press **PROGRAM** ▶ ➡ **AUTO** ◀ ➡ # twice (PULSE) OR * twice (TONE) ➡

➡ **PROGRAM** ▶.

- To cancel during programming, press **PROGRAM** ▶. Start again from the beginning.
- If 3 beeps sound during programming, a wrong key was pressed. Start again from the beginning.

3.3. Storing Phone Numbers in Memory

You can store up to 10 phone numbers in the handset. The dialing buttons (0 to 9) function as memory stations. **The TALK indicator light must be off before programming.**



1 Press **PROGRAM** ▶.
- The TALK indicator flashes.

2 Enter a phone number up to 22 digits.

3 Press **AUTO** ◀.

4 Press a memory station number (0 to 9).
- A beep sounds.
- To store other numbers, repeat steps 1 through 4.

If you misdial

Press **PROGRAM** ▶ to end storing. ➡
➡ Start again from step 1.

To erase a stored number

Press **PROGRAM** ▶ ➡ **AUTO** ◀ ➡
➡ the memory station number (0 to 9) for the phone number to be erased.
- A beep sounds.

- If a pause is required for dialing, press **PAUSE** where needed. Pressing **PAUSE** counts as one digit.

Dialing a Stored Number

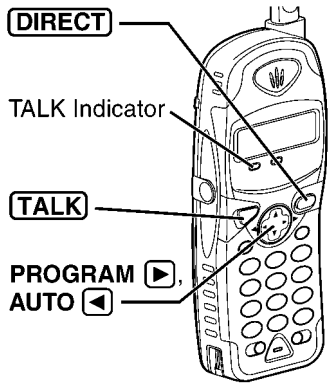
Press **TALK** ➡ **AUTO** ◀ ➡ the memory station number (0 to 9).

- If your line has rotary or pulse service, any access number stored after pressing **TONE** will not be dialed.

3.4. Storing a Phone Number in the DIRECT Button

You can store a phone number in the DIRECT button. The stored number is dialed with a one-touch operation.

The TALK indicator light must be off before programming.



1 Press **PROGRAM** ▶.
- The TALK indicator flashes.

2 Enter a phone number up to 22 digits.
- If you misdial, press **PROGRAM** ▶, and start again from step 1.

3 Press DIRECT.
- A beep sounds.

- If a pause is required for dialing, press PAUSE where needed. Pressing PAUSE counts as one digit.

Dialing a Stored Number in the DIRECT Button

Press TALK ➡ DIRECT.

- If your line has rotary or pulse service, any access numbers stored after pressing TONE will not be dialed.

To erase a stored number: press **PROGRAM** ▶ ➡ **AUTO** ◀ ➡ DIRECT.

3.5. Flash Button

Pressing FLASH allows you to use special features of your host PBX such as transferring an extension call or accessing special telephone services (optional), such as call waiting.

Selecting the flash time

The flash time depends on your telephone exchange or host PBX. You can select the following flash times: "90, 100, 110, 250, 300, 400, 600, 700 msec (milliseconds)", **using the handset near the base unit.** Your phone comes from the factory set to "700 msec".

The TALK indicator light must be off before programming.

Press **PROGRAM** ▶ ➡ Dialing button (1 to 8) ➡ **AUTO** ◀ ➡ FLASH.

1: 90 msec 2: 100 msec 3: 110 msec
4: 250 msec 5: 300 msec 6: 400 msec
7: 600 msec 8: 700 msec

- If 3 beeps sound after programming, a wrong key was pressed. Start again from the beginning.
- If you are connected via a PBX, a longer flash time may be necessary to use PBX functions (transferring a call, etc.). Consult your PBX installer for the correct setting.

4 DISASSEMBLY INSTRUCTIONS

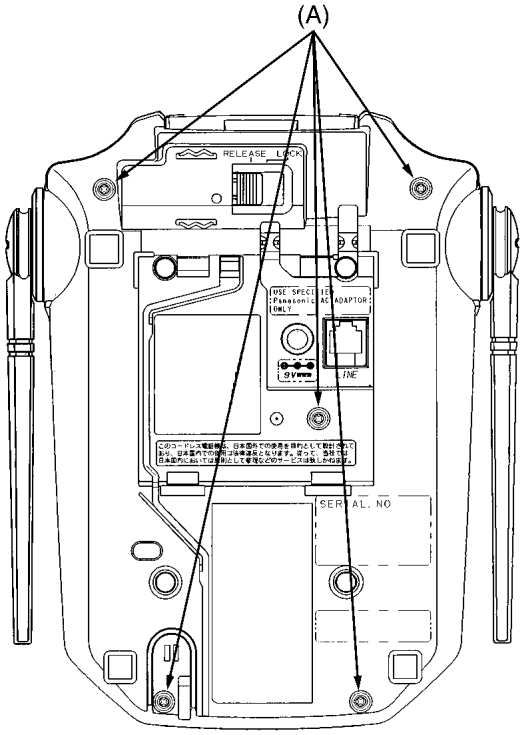
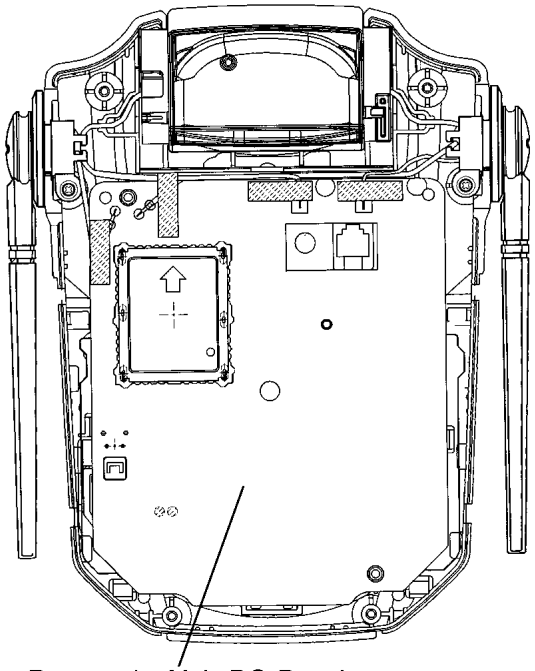


Fig. 1



Remove the Main P.C. Board.

Fig. 2

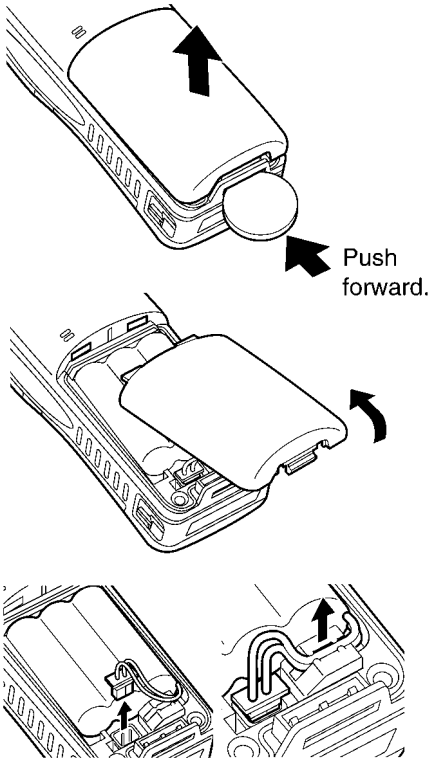


Fig. 3

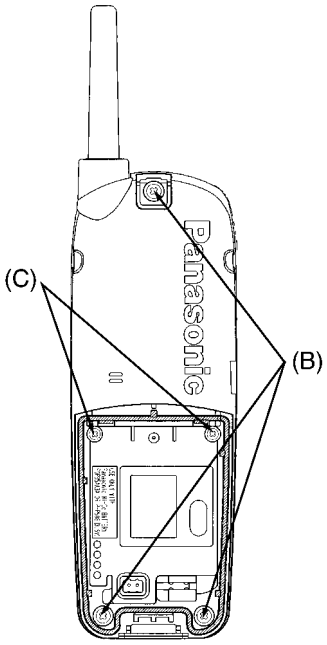


Fig. 4

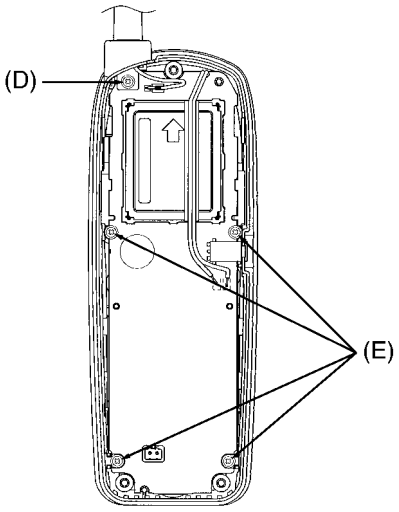


Fig. 5

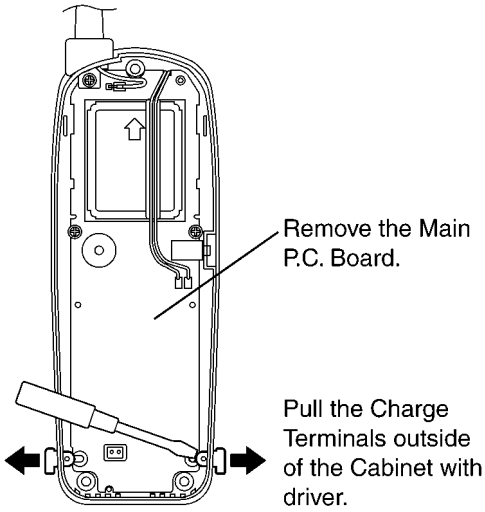


Fig. 6

Ref. No.	Procedure	Show in Fig -.	To remove -.	Remove -.
1	1	1	Lower Cabinet	Screws (2.6 × 14).....(A) × 5
2	1, 2	2	Main P.C. Board	Remove the Main P.C. Board
3	3	3	Battery Cover	Remove the Battery Cover
4	3, 4	4	Rear Cabinet	Screws (2.6 × 12).....(B) × 3 Screws (2 × 8).....(C) × 2
5	3-5	5	Antenna	Screw (2.6 × 12).....(D) × 1
			Main P.C. Board	Screws (2 × 8).....(E) × 4
6	3-6	6	Main P.C. Board	Pull the Charge Terminals outside Remove the Main P.C. Board

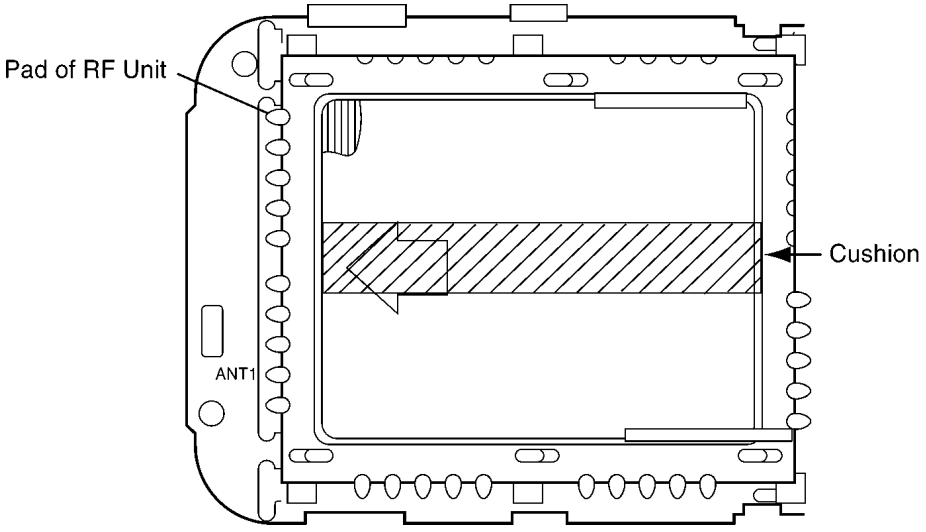
5 ASSEMBLY INSTRUCTIONS

5.1. Replace the RF unit

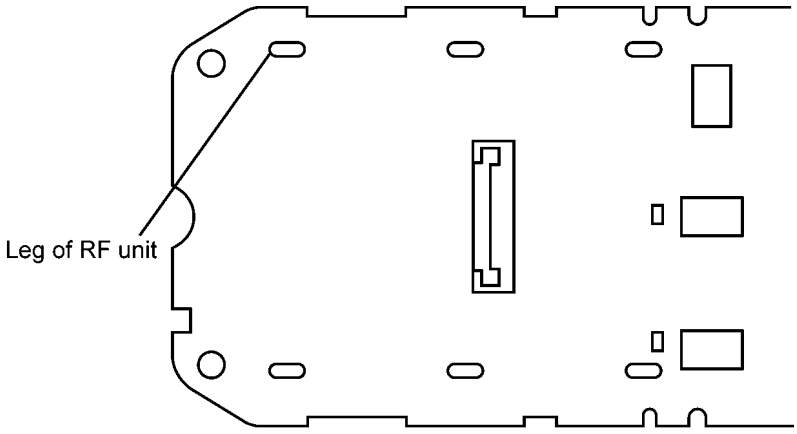
For HS

Follow this procedure below when replacing HS RF unit.

1. Remove speaker cables of LCD unit on HS main board.
   And remove LCD unit.
2. Remove solder on six legs of RF unit.
3. Remove solder on all pads of RF unit.
4. Replace defective RF unit with new HS RF unit.
   NOTE:
   Do not use BU RF unit for HS one.
   HS RF unit is different from BU one.
5. Solder all pads of RF unit.
6. Solder six RF legs.
7. Put LCD unit and solder speaker wire.
   NOTE:
   Speaker wire has polarity.



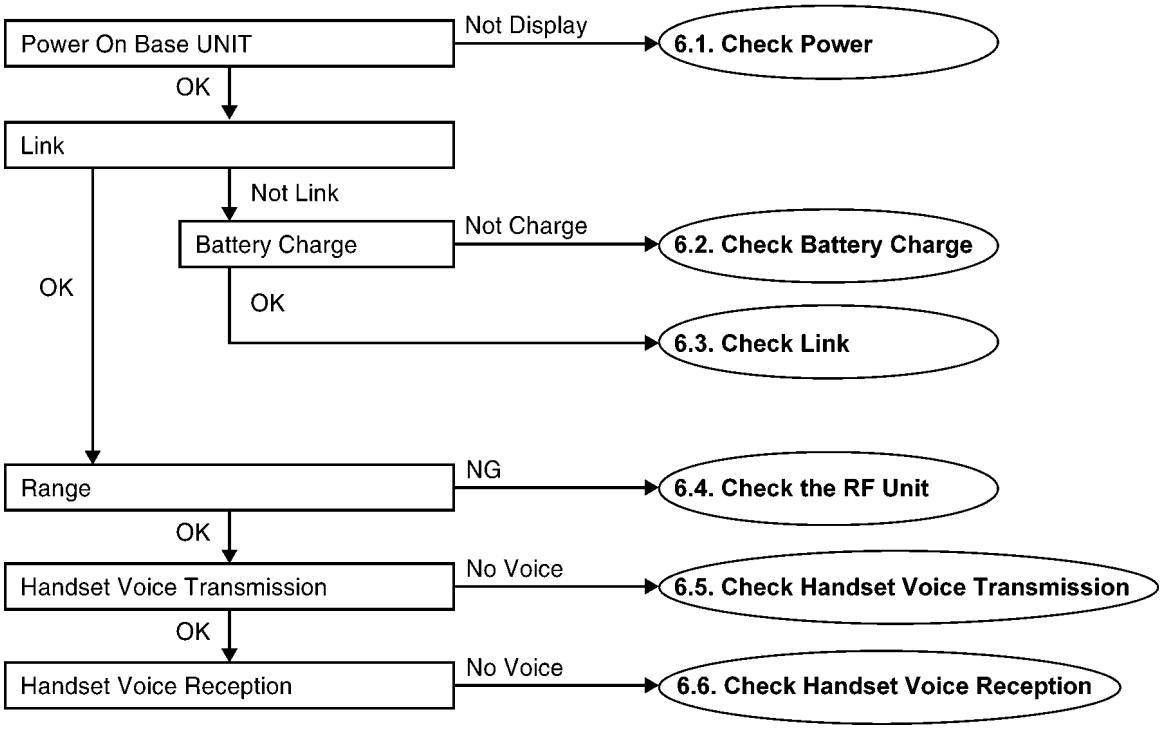
(**Component View**)



(**Solder Side View**)

6 TROUBLESHOOTING GUIDE

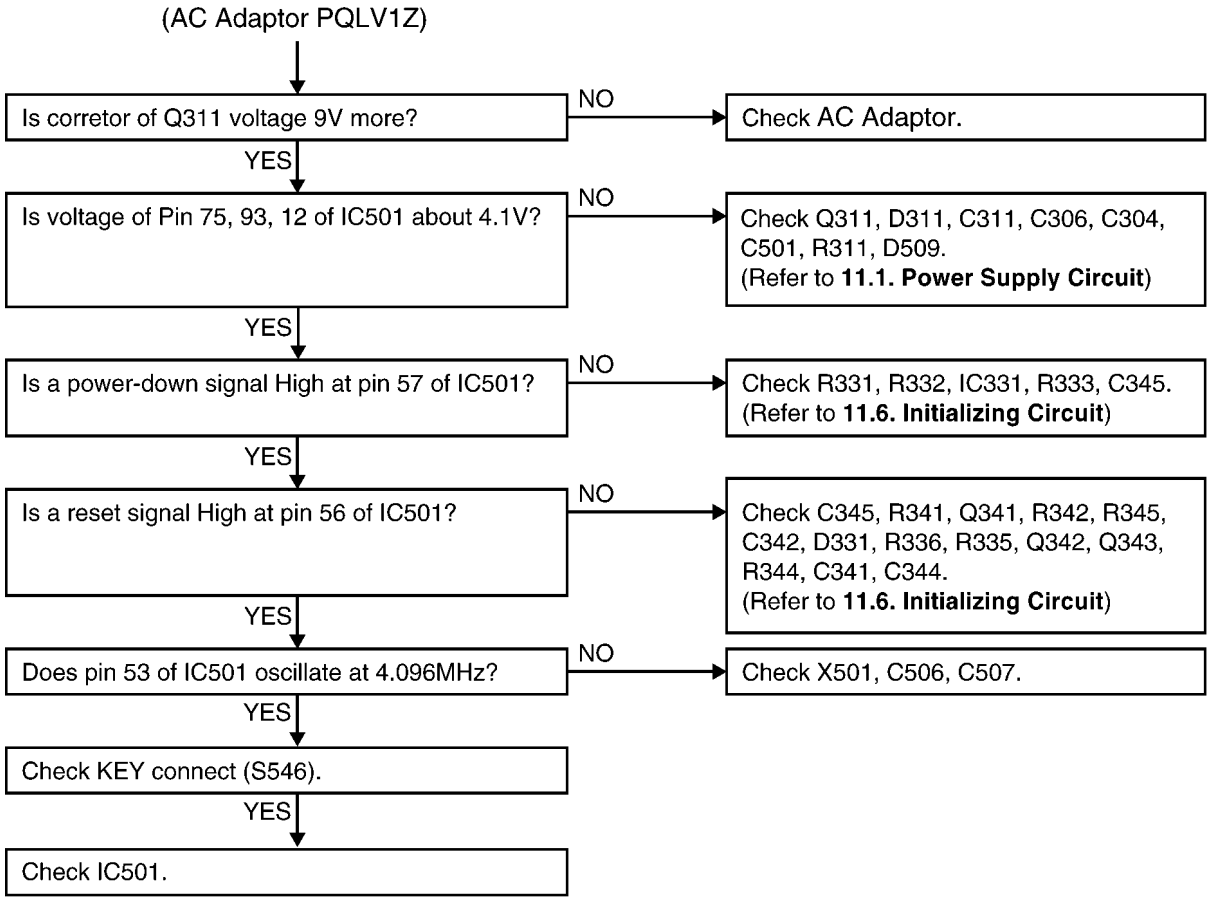
MAIN



6.1. Check Power

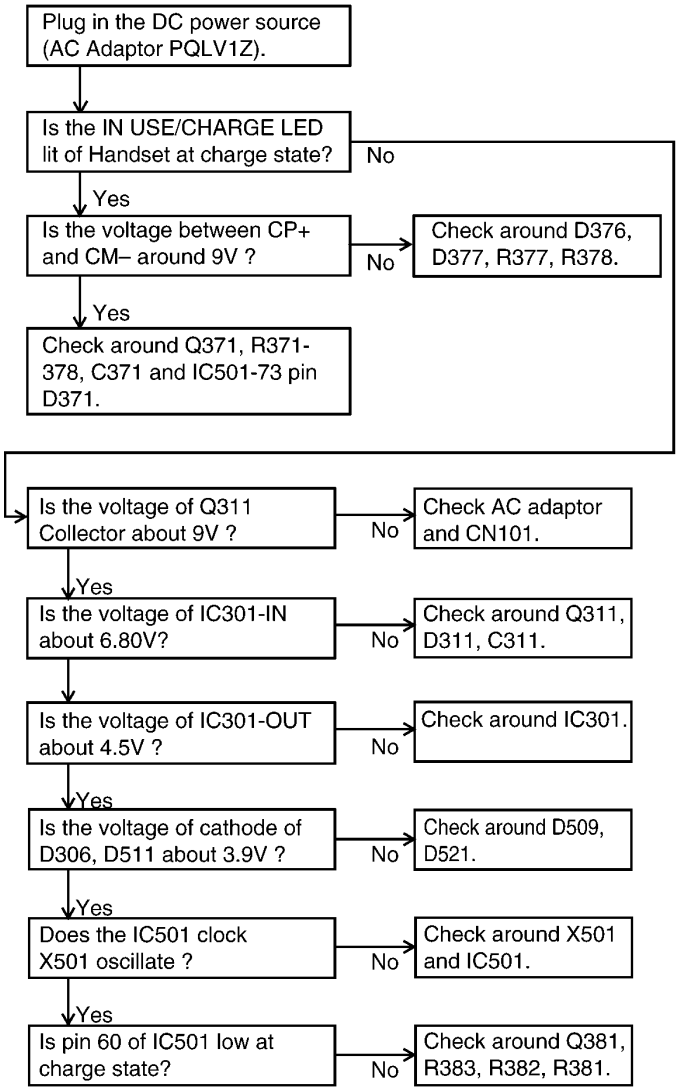
BASE UNIT

Is the AC Adaptor inserted into 120V outlet?

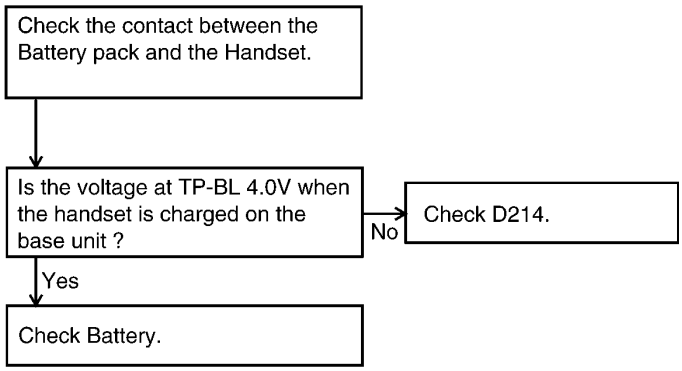


6.2. Check Battery Charge

BASE UNIT



HANDSET

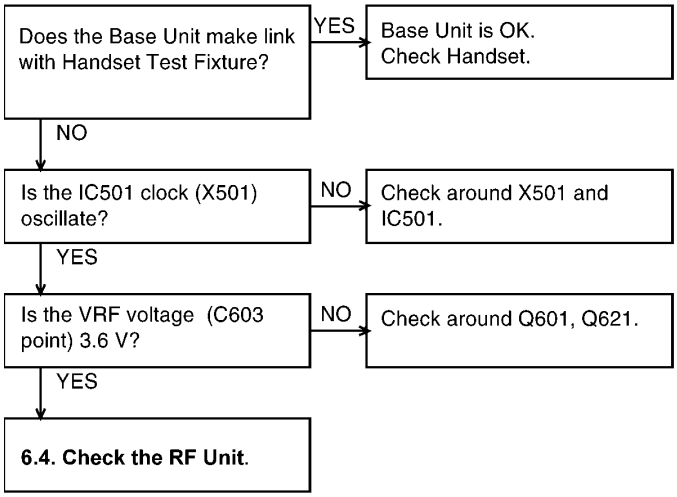


NOTE:

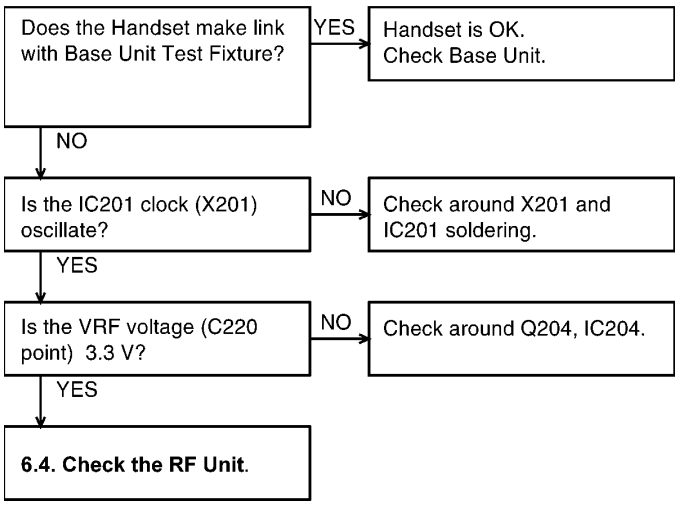
- CP/CM: Refer to **Base Unit Reference Drawing 1**.
- TP-BL: Refer to **Handset Reference Drawing**.

6.3. Check Link

BASE UNIT



HANDSET



6.4. Check the RF Unit

6.4.1. Finding out the Defective Unit

Prepare HS Test Fixture and BU Test Fixture. Place the HS Test Fixture on the cradle of the base unit for checking, then confirm that they are linked. Place the handset for checking on the cradle of the BU Test Fixture, then confirm that they are linked. How to confirm the link is as follows; press the TALK button and confirm Handset in use is displayed on BU LCD.

6.4.2. Handset Test Fixture for Base Unit

Test Fixture has two modes.

1. TEST mode: (RF Power Low mode)

   The switch of Test Fixture changed with TEST mode side.

   Then Test Fixture is in TEST mode.

2. Normal mode: (RF Power Normal mode)

   The switch of Test Fixture changed with Normal mode side.

   Then Test Fixture is in Normal mode.

NOTE:

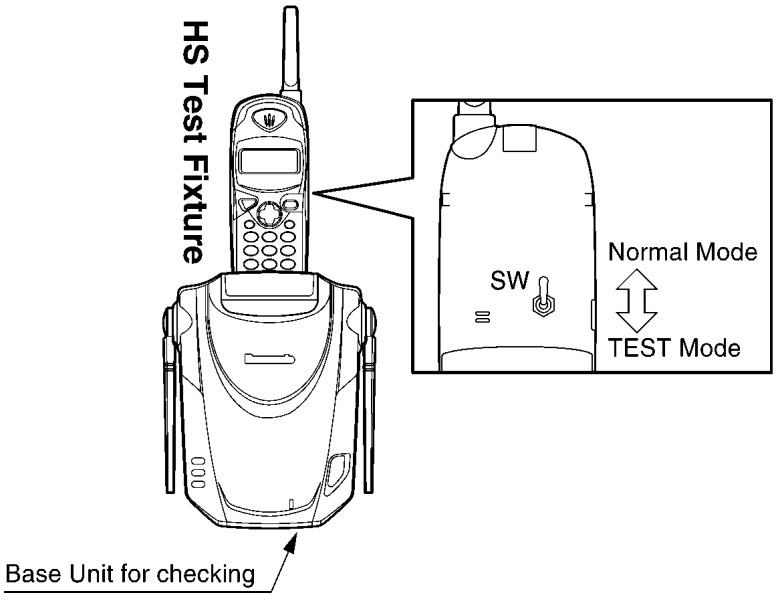
Audio is coming from Receiver whether switch is TEST mode or Normal mode.

This test simulates the handset is at very large distance from the base unit and the TX signal from handset to base is very small.

Procedure: First place handset Test Fixture on base under test to charge (exchange security code); then remove handset from base after you hear a beep; then press TALK to operate. The LCD will show TALK. This means that the base unit sensitivity is OK. If a beep is not heard, **Replace the RF unit**.

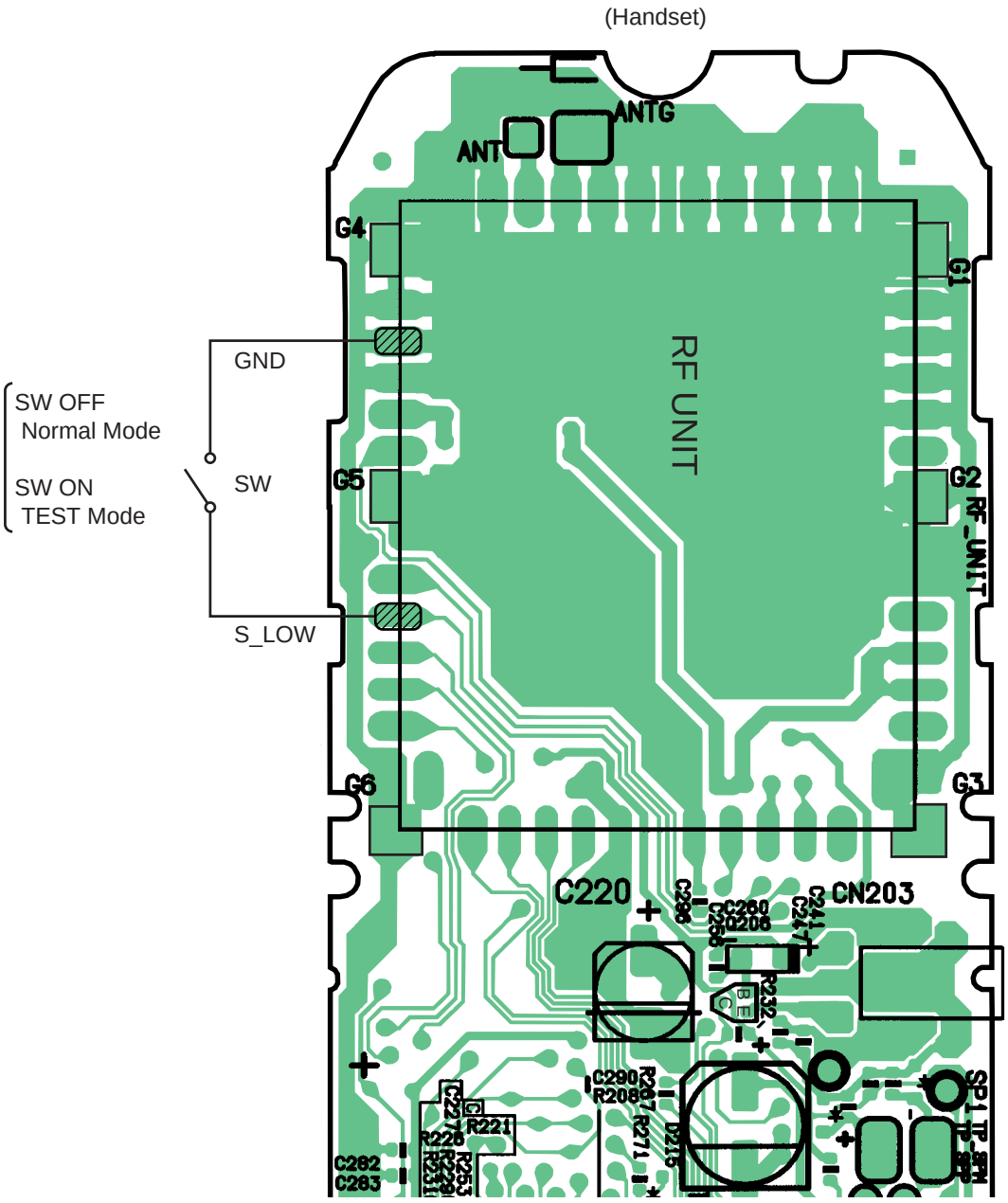
NOTE:

1) Only KX-TG2583C/2563C/2553C/2503C with marks HS Test Fixture can be used for troubleshooting. Regular KX-TG2583C/2563C/2553C/2503C production samples do not have the switches needed for troubleshooting.



6.4.2.1. Handset Test Fixture Reference Drawing

As for TEST fixture, only the switch as shown in figure is connected to mass production set.



NOTE:

SW: ON (Base Unit: nomal)

10 m more: No Link

5 m less: Link

6.4.3. Base Unit Test Fixture for Handset

Switch to control normal mode and test modes on this BU Test Fixture.

Test Fixture has two modes.

1. TEST mode: (RF Power Low mode)

   The switch of Test Fixture changed with TEST mode side.

   Then Test Fixture is in TEST mode.

2. Normal mode: (RF Power Normal mode)

   The switch of Test Fixture changed with Normal mode side.

   Then Test Fixture is in Normal mode.

NOTE:

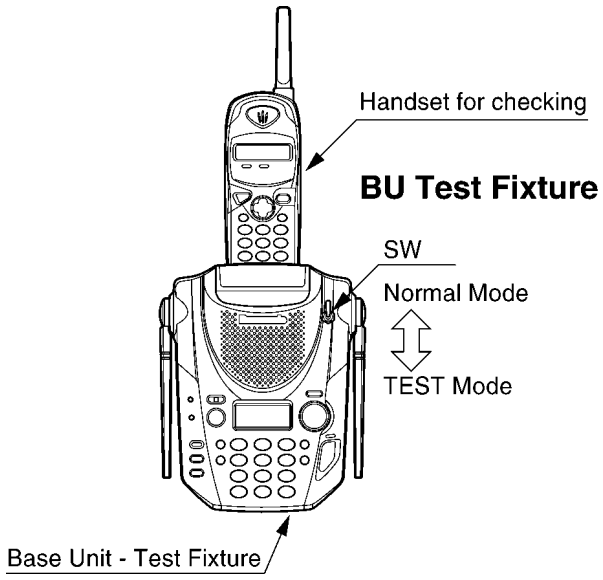
Audio is coming from Receiver whether switch is inserted or not.

This test simulates the handset is at very large distance from the base unit and the TX signal from base to handset is very small.

Procedure: First, place handset under test to charge (exchange security code), then remove handset from base after you hear a beep. Press TALK button on handset and if it links with the base, then this handset sensitivity is OK. If a beep is not heard, **Replace the RF unit**.

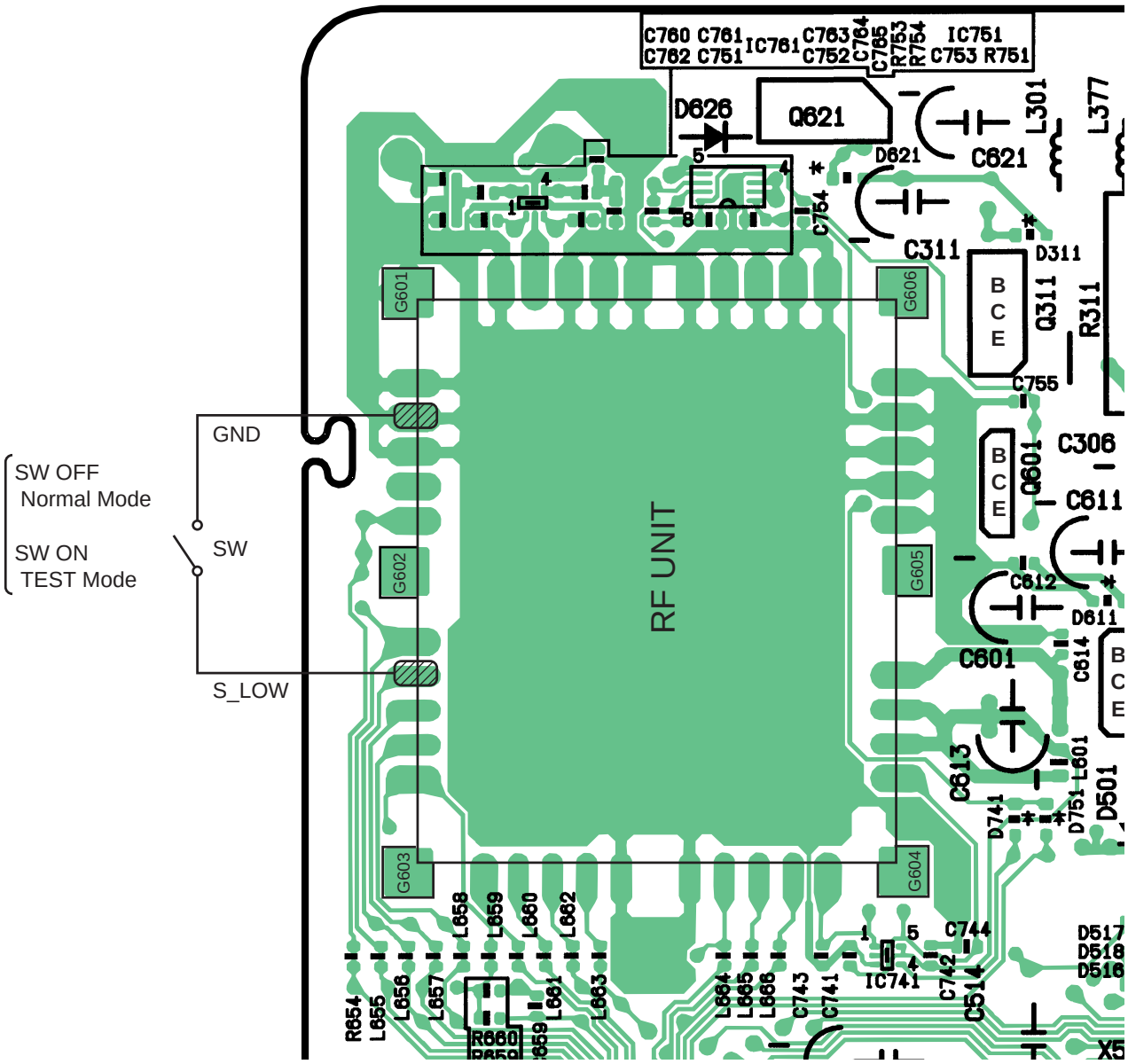
NOTE:

1) Only KX-TG2583C/2563C/2553C/2503C with marks BU Test Fixture can be used for troubleshooting. Regular KX-TG2583C/2563C/2553C/2503C production samples do not have the software needed for troubleshooting.



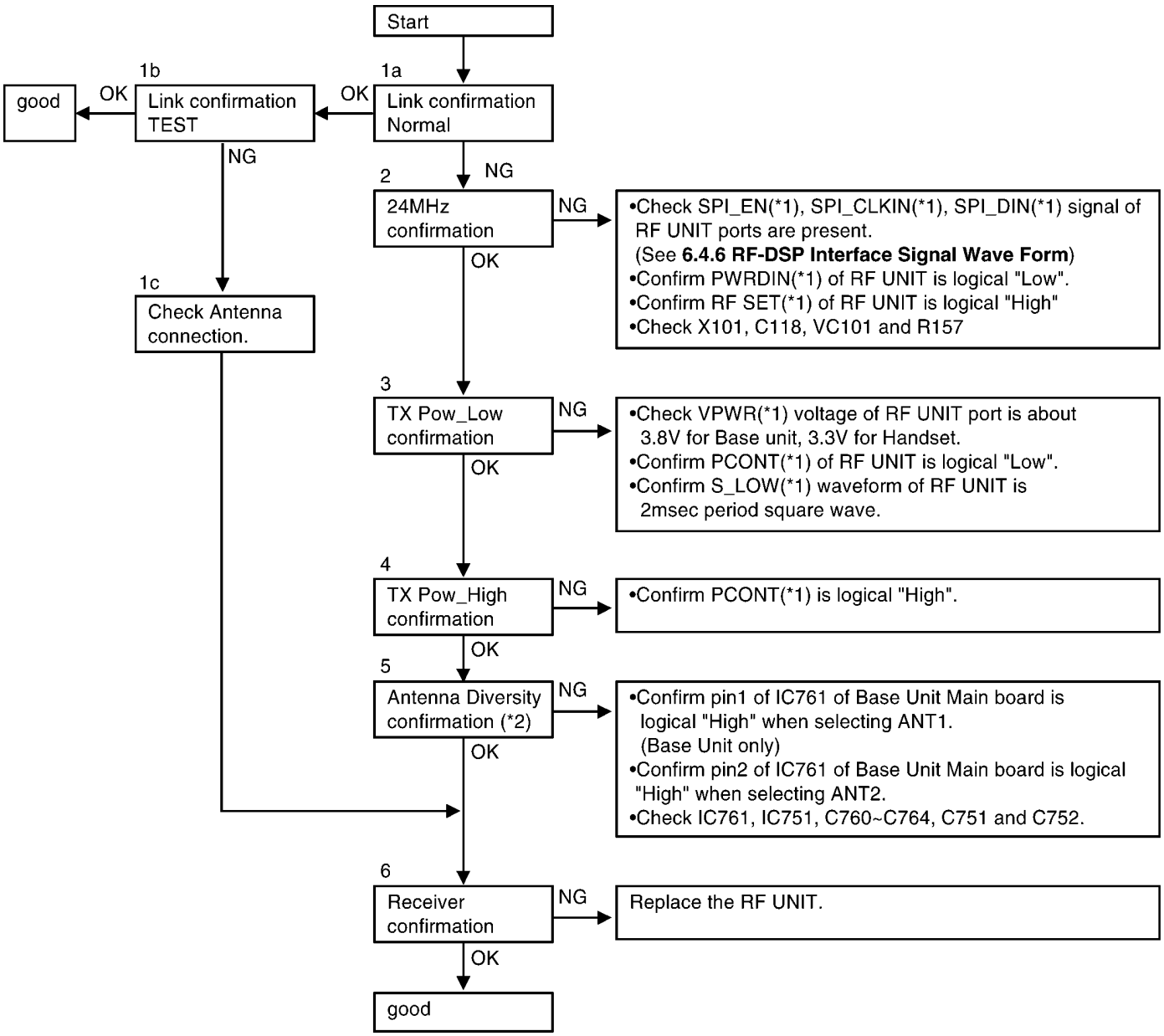
6.4.3.1. Base Unit Test Fixture Reference Drawing

(Base Unit)



6.4.4. RF Check Flowchart

Each item (1a ~ 6) of RF Check Flowchart is corresponded to **Check Table for RF Block**. Please refer each item one by one.



(*1) See **RF Unit Reference Drawing (Base Unit and Handset)**.

(*2) Base unit RF only, refer to **Check Table for RF Block**.

6.4.5. Check Table for RF Block

No.	Item	BU (Base unit) (*1)	HS (Handset) (*1)
1a	Link confirmation Normal	1. The switch of “HS Test Fixture” is changed to normal mode side, and is charge of "HS Test Fixture". 2. Press [TALK] key of "HS Test Fixture" to establish link about one foot (30cm) away from "Base unit". 3. Confirm to link.	1. The swich of “BU TEST Fixture” is changed to “Normal mode side”, and is charge of "BU Test Fixture". 2. Press [TALK] key of "Handset" to establish link about one foot (30cm) away from "BU Test Fixture". 3. Confirm to link.
1b	Link confirmation Test	1. The switch of “HS Test Fixture” is changed to TEST mode side, and is charge of "HS Test Fixture". 2. Press [TALK] key of "HS Test Fixture" to establish link about one foot (30cm) away from "Base unit". 3. Confirm to link.	1. The swich of “BU TEST Fixture” is changed to “TEST mode side”, and is charge of "BU Test Fixture". 2. Press [TALK] key of "Handset" to establish link about one foot (30cm) away from "BU Test Fixture". 3. Confirm to link
1c	Check Antenna connection	1. Check ANT1(*2) and ANT2(*2) soldering. 2. Check ANT1(*2) and ANT2(*2) points are not shorted to GND.	1. Check Antenna(*3) on HS main board soldering.
2	24MHz Adjustment	1. Set BU to [Test STANDBY] mode (*5) 2. Confirm X101 frequency within 24 MHz ± 720Hz at TP_FREQ(*4) of RF Unit. If X101 frequency is spec out than adjust frequency within 24 MHz ±100 Hz by VC101.	1. Set HS to [Test STANDBY] mode (*5) 2. Confirm X101 frequency within 24 MHz ± 720Hz at TP_FREQ(*4) of RF Unit. If X101 frequency is spec out than adjust frequency within 24 MHz ±100 Hz by VC101.
3	TX Pow_Low confirmation	1. Put low loss high frequency wire to ANT1(*2) and GND(*2) 2. Connect this wire to Spectrum analyzer. 3. Set BU to [Low Power] mode (*5) 4. Confirm TX power level within -5 ~ +10dBm	1. Remove Antenna on HS main board. Put low loss high frequency wire to ANT(*3) and GND (*3) 2. Connect this wire to Spectrum analyzer. 3. Set HS to [Low Power] mode (*5) 4. Confirm TX power level within -5 ~ +10dBm
4	TX Pow_High confirmation	5. Set BU to [High Power] mode (*5) 6. Confirm TX power level within +20±4dBm	5. Set HS to [High Power] mode (*5) 6. Confirm TX power level within +20±4dBm
5	Antenna Diversity confirmation	7. Set BU to [Test STANDBY] mode (*5) 8. Put low loss high frequency wire to ANT2 (*2) and GND (*2) 9. Connect this wire to Spectrum analyzer 10. Press [1] key to activate the ANT2. 11. Set BU to [High Power] mode (*5) 12. Confirm TX power level within +20±4dBm	
6	Receiver confirmation	Same as Item 1b.	Same as Item 1b.

(*1) BU: Base Unit, HS: Handset.

(*2) See **Base Unit Reference Drawing 1**.

(*3) See **Handset Reference Drawing**.

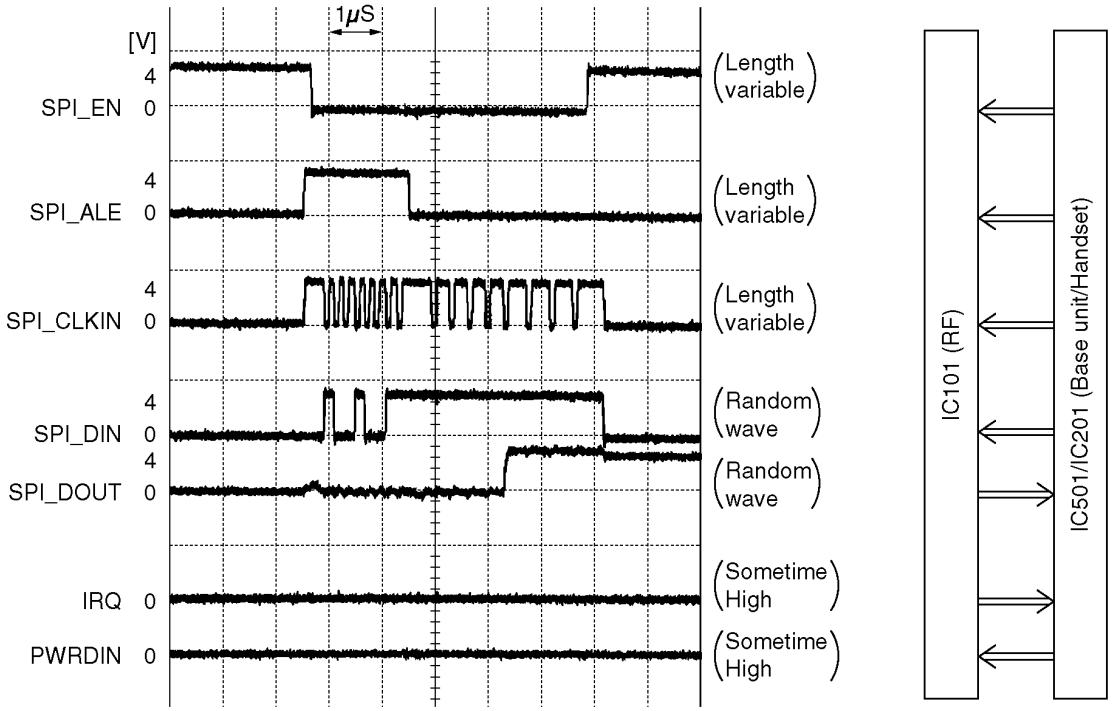
(*4) See **RF Unit Reference Drawing (Base Unit and Handset)**.

(*5) See **TEST MODE AND ADJUSTMENT**.

6.4.6. RF-DSP Interface Signal Wave Form

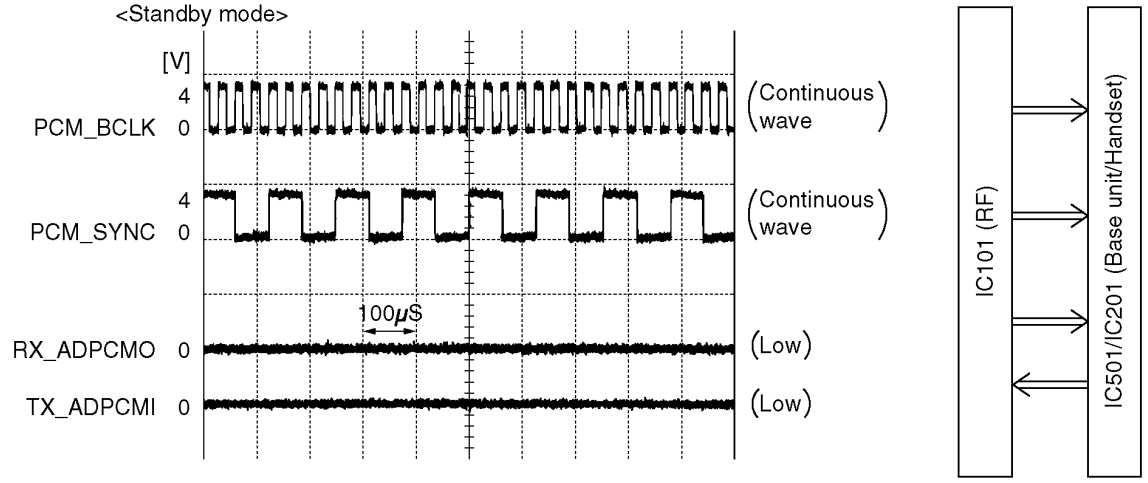
(1) Serial control line

<Standby mode>

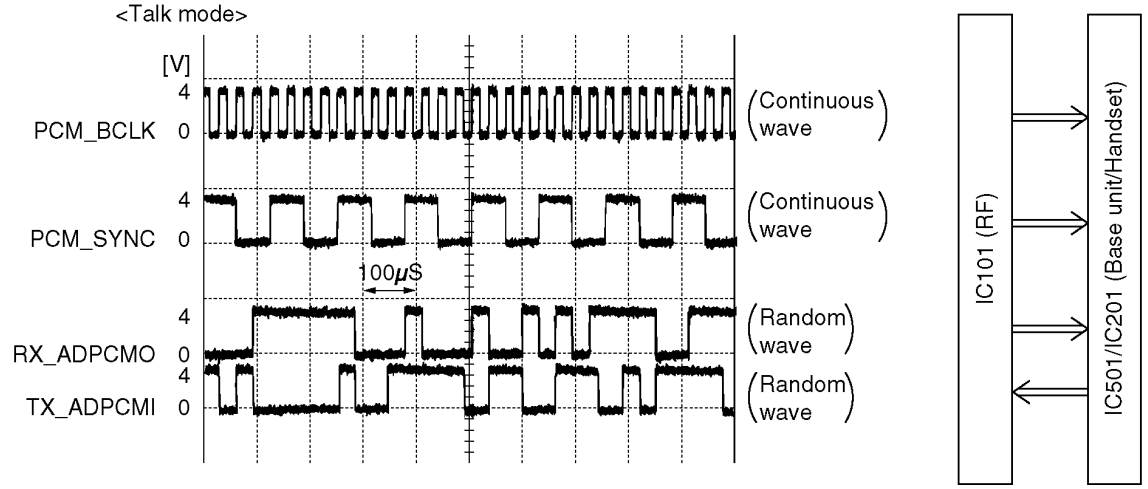


(2) ADPCM (Digital sound) line

<Standby mode>

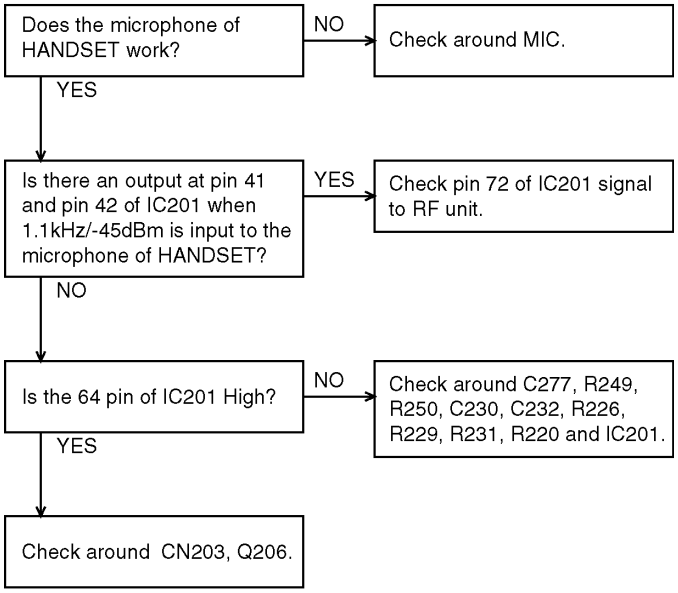


<Talk mode>

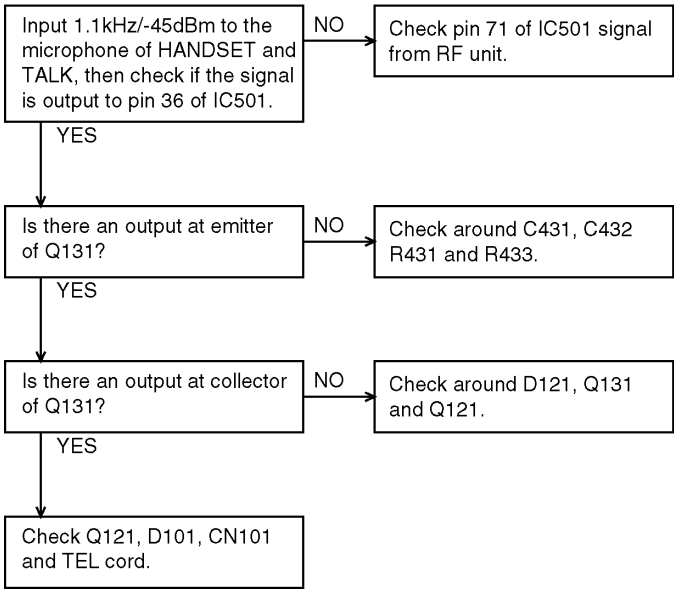


6.5. Check Handset Voice Transmission

HANDSET

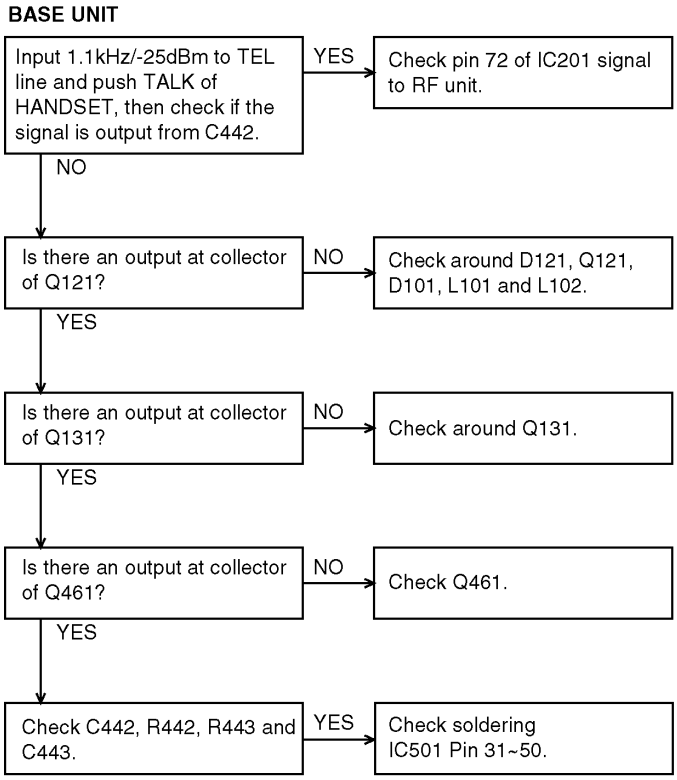


BASE UNIT

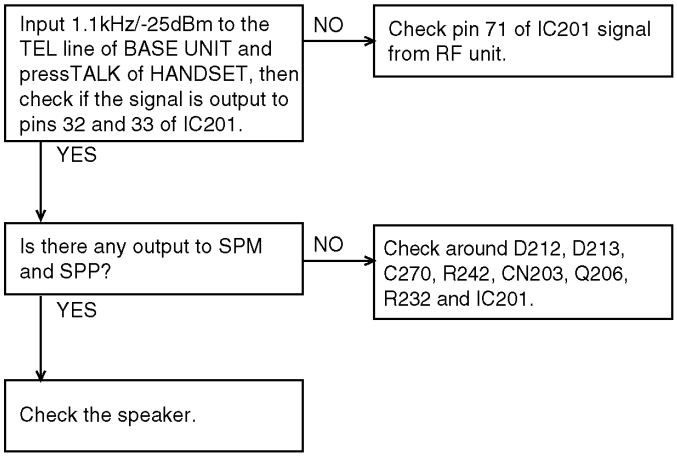


6.6. Check Handset Voice Reception

BASE UNIT

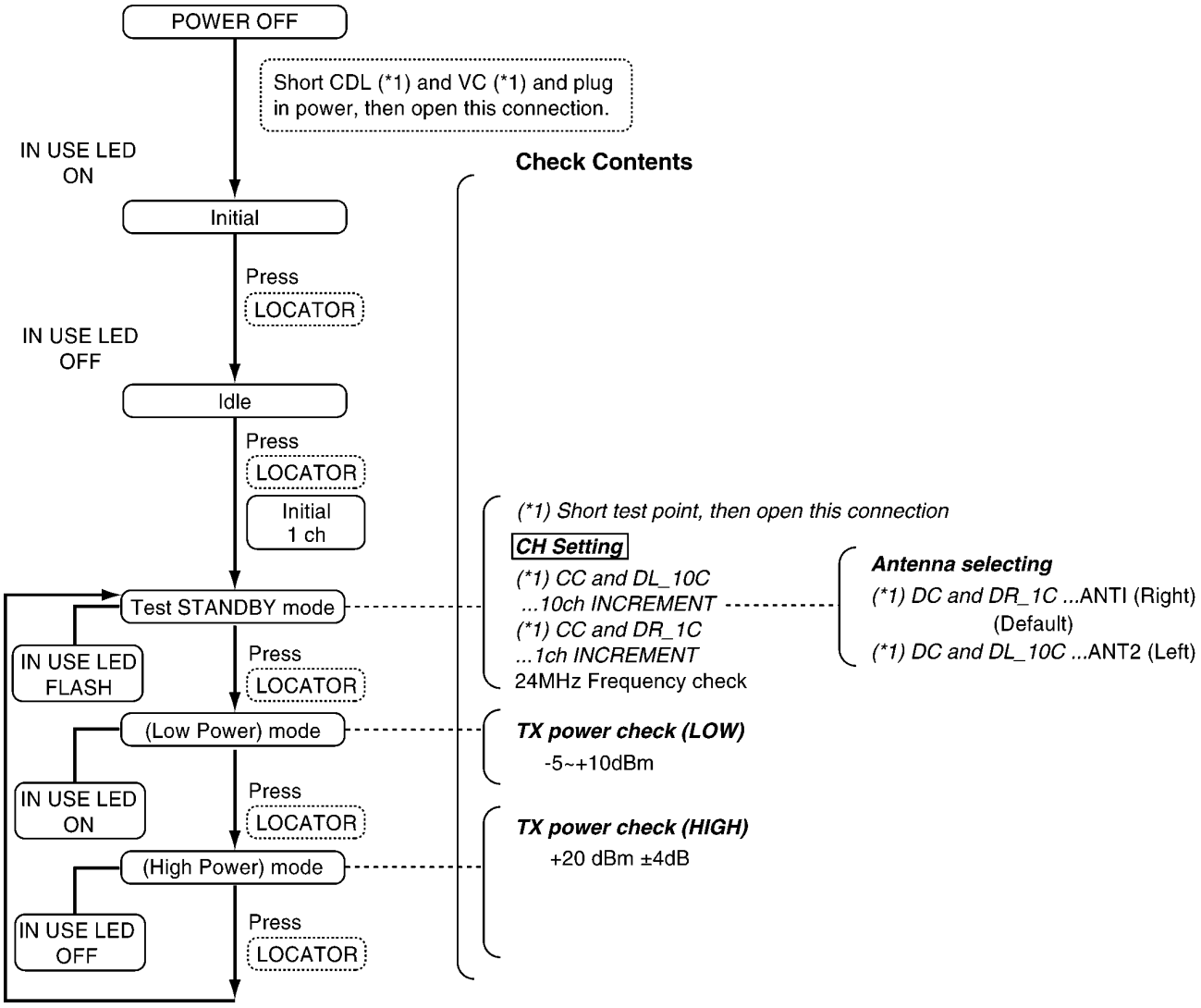


HANDSET



7 TEST MODE AND ADJUSTMENT

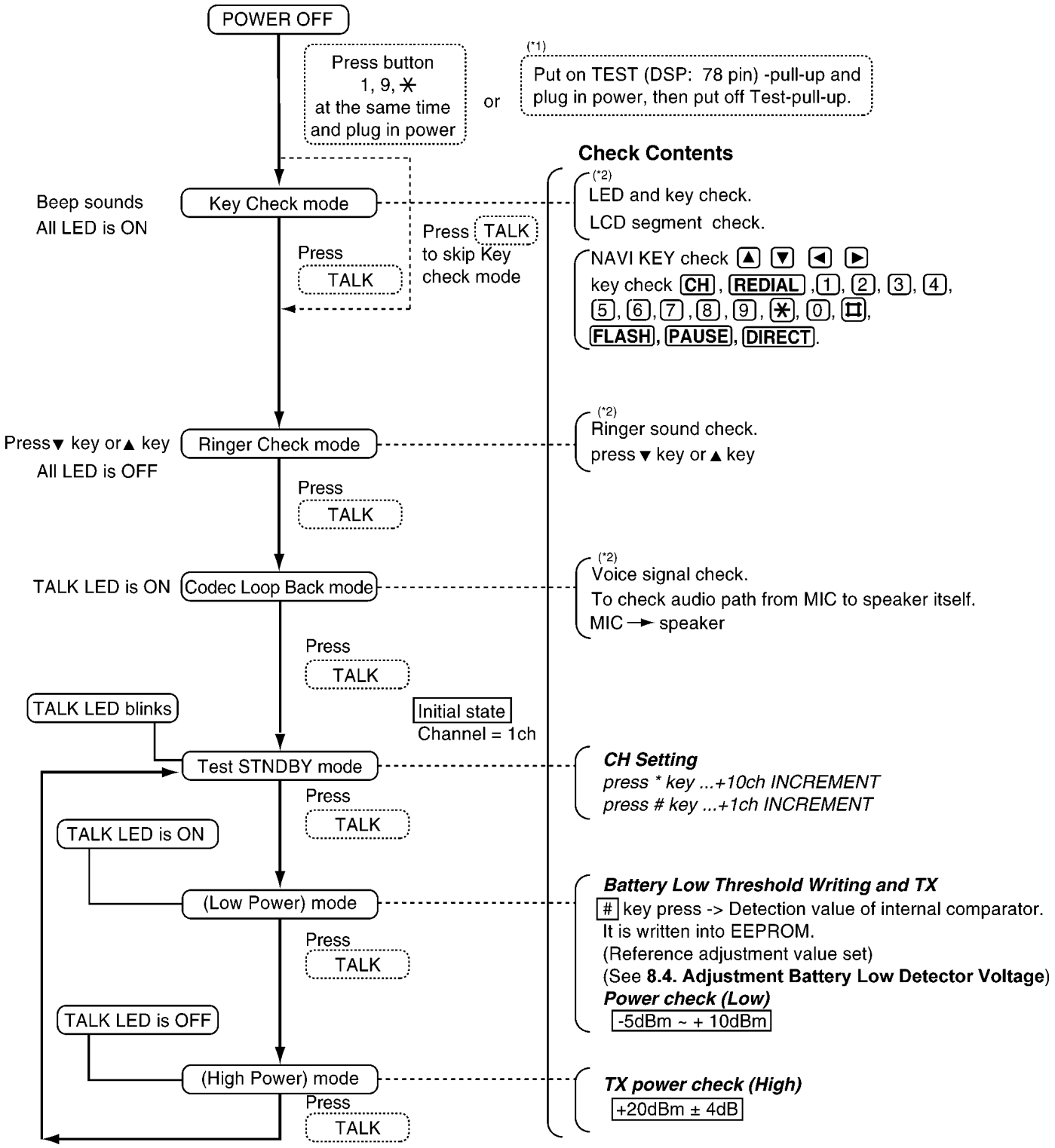
7.1. Test Mode Flow Chart for Base Unit



(*1) See **Base Unit Reference Drawing 1**.

(*2) Special check method for Base Unit individually.

7.2. Test Mode Flow Chart for Handset



(*1) See **Handset Reference Drawing**.

(*2) Special check method for Handset individually.

7.3. Adjustment Battery Low Detector Voltage

After replacing handset's DSP (IC201) and EEPROM, Re-writing Battery Low voltage to EEPROM is required.
Following Test mode flow chart (Refer to **Test Mode Flow Chart for Handset**),
DC power supply and Battery connector are required in this adjustment.

1. Set 3.9V for DC power supply.
2. Place handset in test mode.
3. Press "TALK" key 4 times to TX-Low mode. (CW Tx Low is displayed on LCD)
4. Set 3.51V for DC power supply.

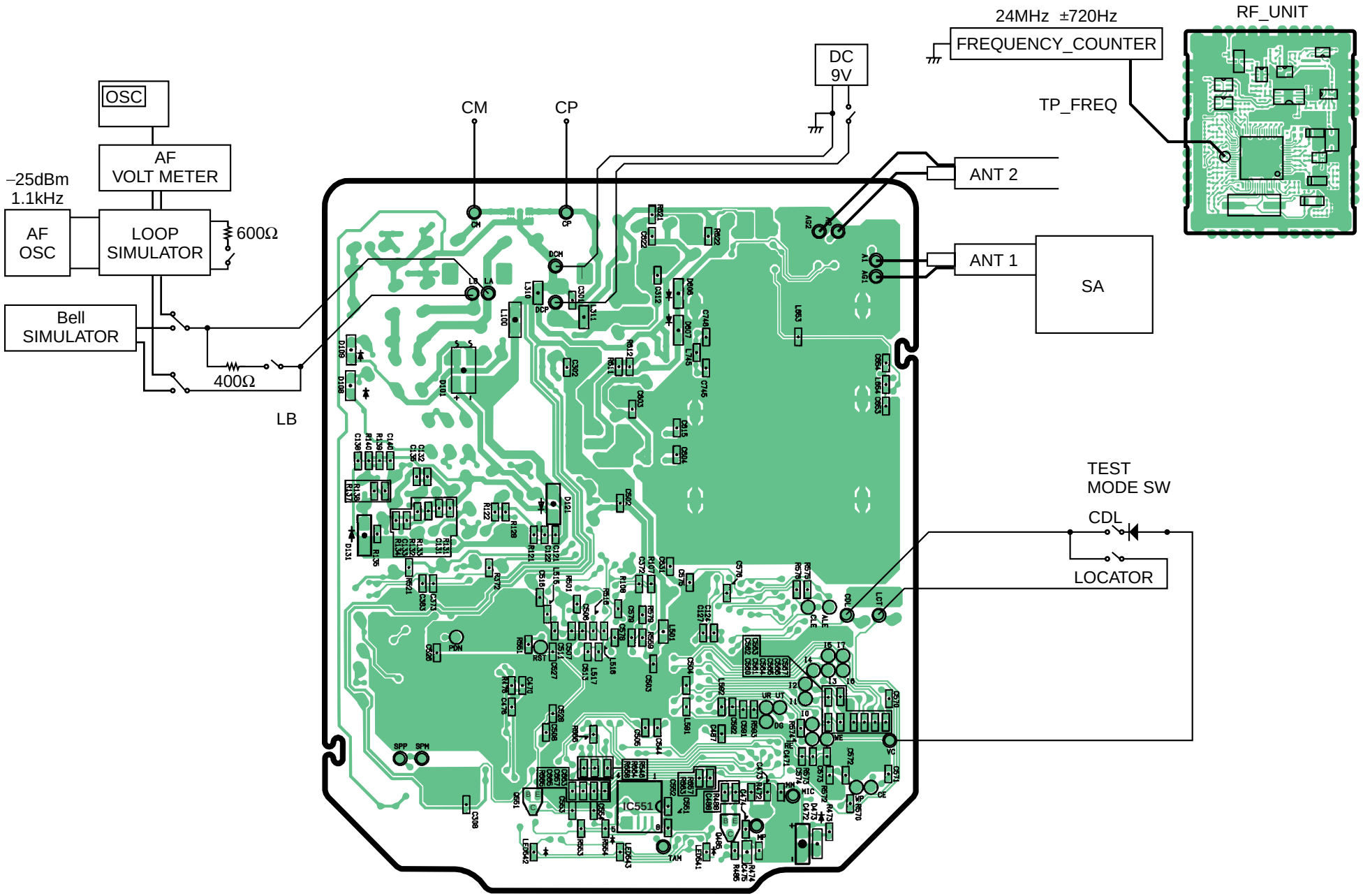
*** Check voltage at battery connector, because some voltage drop is happened, using long or thin cable.**

5. Press "#" key to write voltage value in EEPROM.
6. Turn power off. Then this value is available.

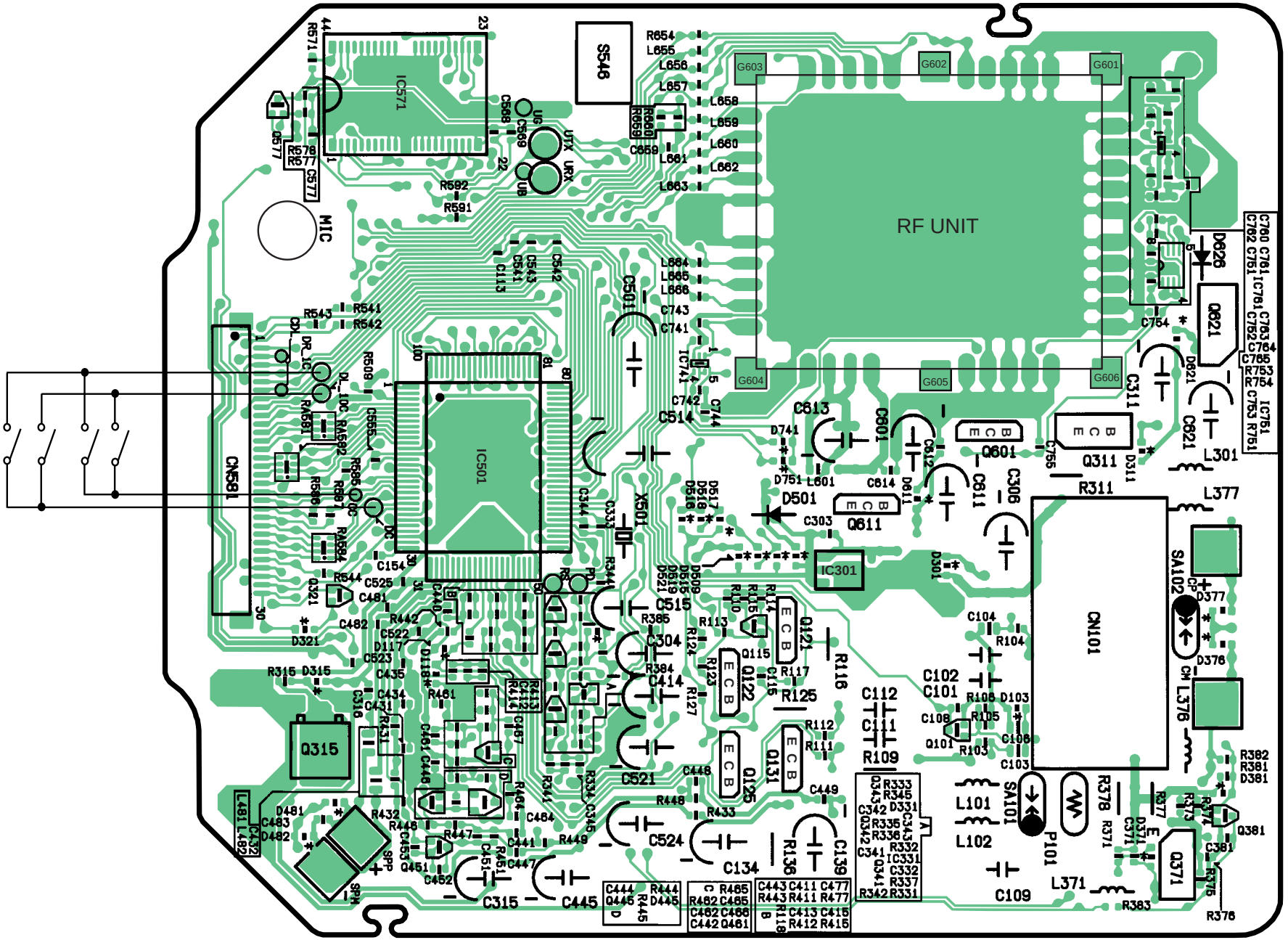
NOTE

Refer to **Handset Reference Drawing** for connection of DC power source and voltmeter.

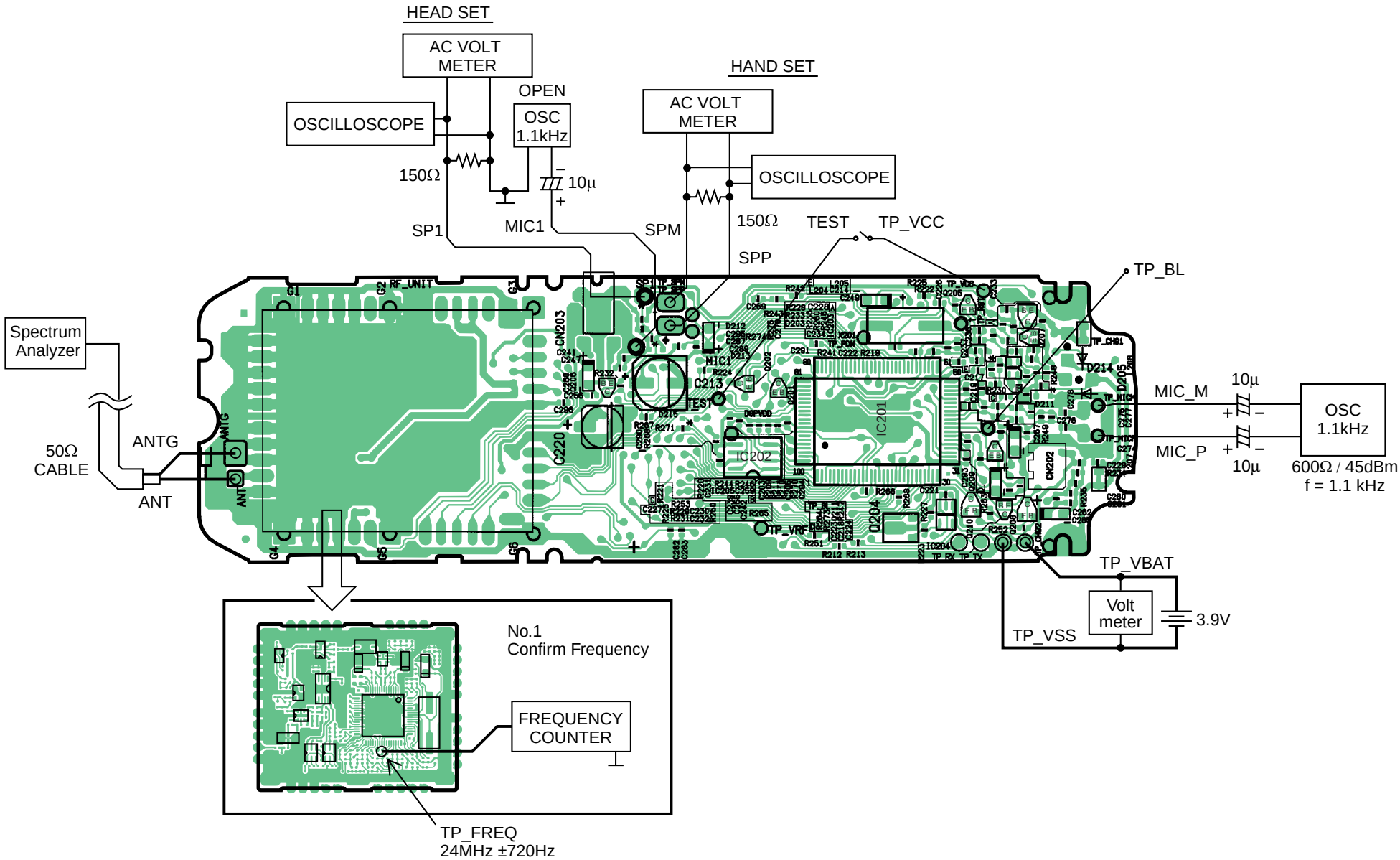
7.4. Base Unit Reference Drawing 1



7.5. Base Unit Reference Drawing 2



7.6. Handset Reference Drawing



7.7. Frequency Table

(TDD: time division duplex)

Channel	TX/RX Frequency (GHz)	Channel	TX/RX Frequency (GHz)
1	2.4540	2	2.4555
3	2.4570	4	2.4585
5	2.4600	6	2.4615
7	2.4630	8	2.4645
9	2.4660	10	2.4675
11	2.4690	12	2.4705
13	2.4720		

8 DESCRIPTION

8.1. Frequency

The frequency range of 2.4540 GHz ~ 2.4720 GHz is used. Transmitting and receiving channels between base unit and handset is same frequency. Refer to the Frequency Table.

8.2. Time Division Duplex (TDD) operation

Transmission/reception between the base unit and handset is performed by time-sharing as shown in Fig. 7. 1 slot time of transmission and reception is 1mS. Same frequency is used in transmitting and receiving. The figure shows an example; the frequency of 1ch is used in transmitting between the base unit and handset.

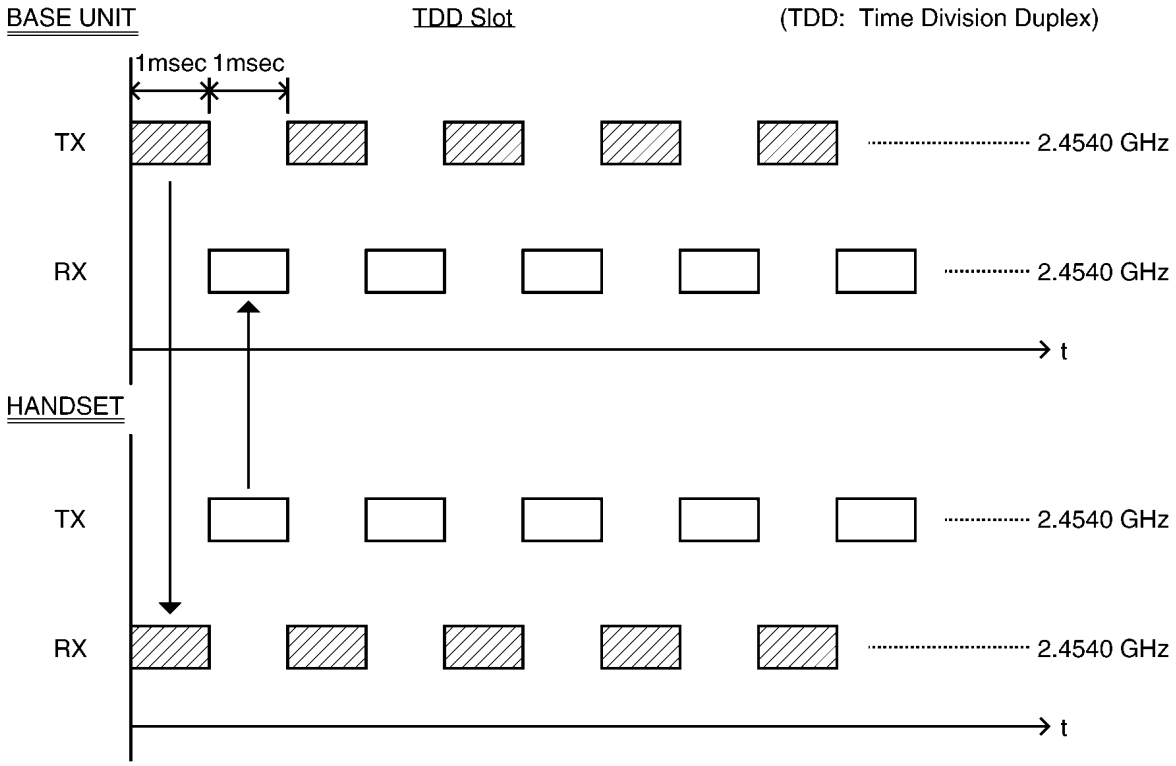


Fig. 7

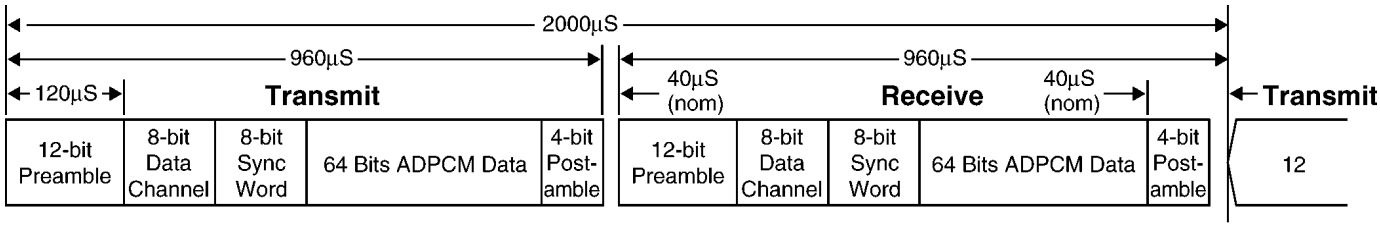
8.2.1. TDD Frame Format

The TDD frame is 2mS in length, and is composed of two symmetrical 960 µS TX and RX subframes. Each subframe contains 96 bits of 10µS duration, with 40µS guard times between both TX and RX subframes.

Each subframe consists of the following five fields:

- A 12-bit Preamble field
- An 8-bit Data Channel field
- An 8-bit Sync Word
- A 64-bit ADPCM Payload
- A 4-bit Post-amble

Both the 8-bit sync word and 8-bit data channel are programmable via the DSP interface. In addition, the 64-bit payload can be filled either with ADPCM voice data, or can be used by the host DSP as a fast data channel between base and handset.



8.3. Spread Spectrum

Transmission and reception are operated using the spread spectrum method.

DSS (Digital Spread Spectrum)

Mixing the original signal with the pseudo random noise code (PN code) works the spread spectrum. In this system PN code is 15 chip. Although the band width is spread fifteen times, the power level per channel becomes lower.

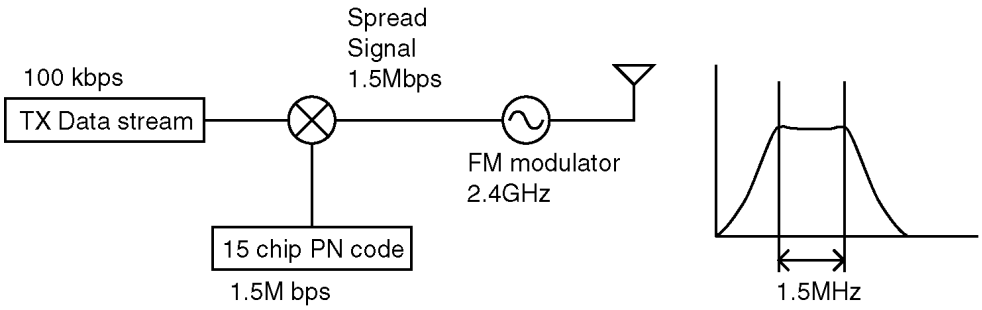


Fig. 8

8.4. Signal Flowchart in the Whole System

Reception

CN101 of the base unit is connected to the TEL line, and the signal is input through the bridge diode D101. While talking the relay (Q121) is turned ON and amplified at the amplifiers Q461, then led to DSP (IC501). DSP generates ADPCM signal. The ADPCM signal is input to RFIC (IC101) of RF UNIT, and is mixed with pseudo random noise code (PN code) to spread the spectrum. RFIC outputs FSK modulated RF signal. The RF signal is passed through the balun (T101) and filter (L107) to the T/R switch (IC109). And the RF signal amplifies by the power amplifier (IC105) and fed into T/R switch (IC110) and passes through filter (L106) to Diversity ANTENNA. As for the handset, RF signal from the antenna passes through filter (L106) and switch by T/R switch (IC110) to LNA (IC106). The RF signal is amplified by LNA (IC106) and switched by T/R switch (IC109) and input to RFIC passing through filter (L107) and the balun (T101) to perform the de-spread, then input to DSP (IC201). DSP performs ADPCM decoding to convert the signal into the voice signal, then it is output to the speaker.

Transmission

The voice signal input from the microphone is led to DSP (IC201). The DSP generates ADPCM signal. As well as the reception, it is converted into the RF signal by RFIC (IC101). Passing through the balun (T101) and filter (L107), to the T/R switch (IC109). And the RF signal amplifies by the power amplifier (IC105) and fed into T/R switch (IC110) and passes through filter (L106) to ANTENNA. As for the base unit, RF signal from the Diversity antenna passes through filter (L106) and switch by T/R switch (IC110) to LNA (IC106). The RF signal is amplified by LNA (IC106) and switched by T/R switch (IC109) and is input to RFIC (IC101) passing through filter (L107) and the balum (T101) to perform the de-spread, then input to DSP (IC201). DSP performs ADPCM decoding to convert the signal into the voice signal. The voice signal is amplified at the TX amplifier (Q131), then output to the TEL line (CN101) through the relay (Q121) and bridge (D101).

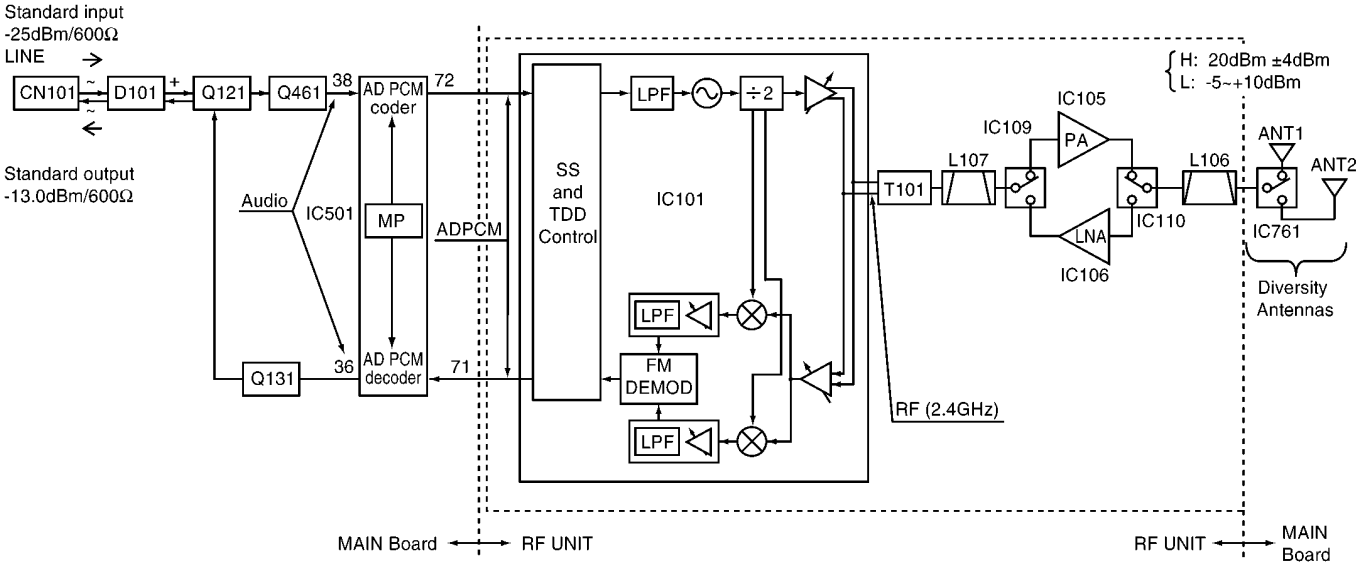


Fig. 9-1 BASE UNIT

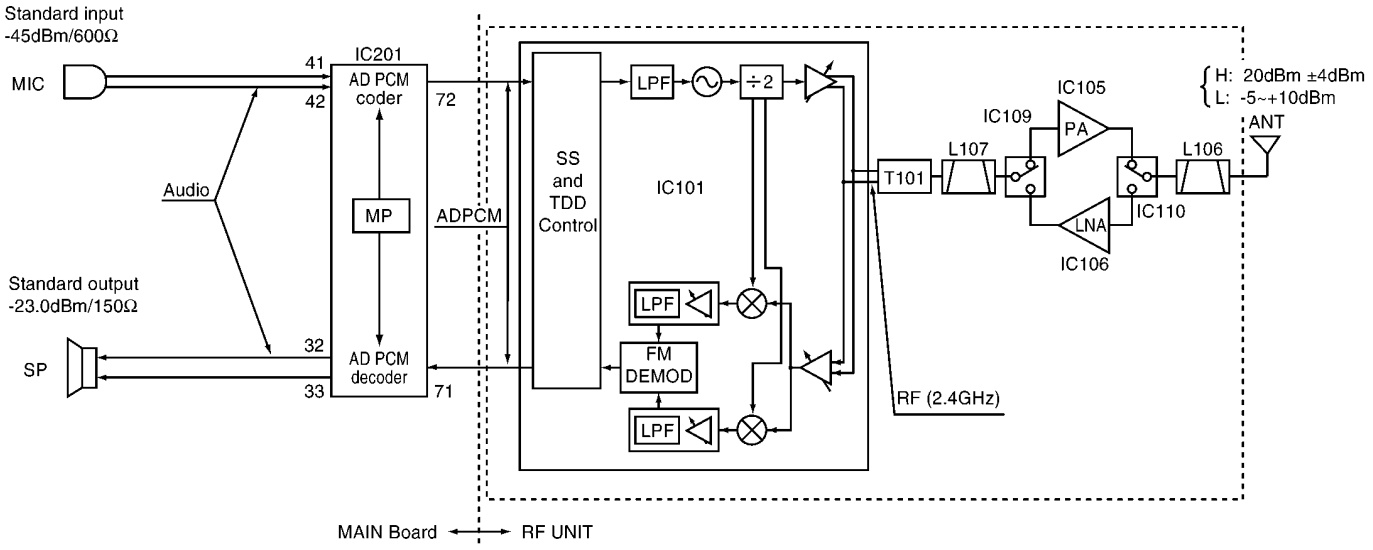
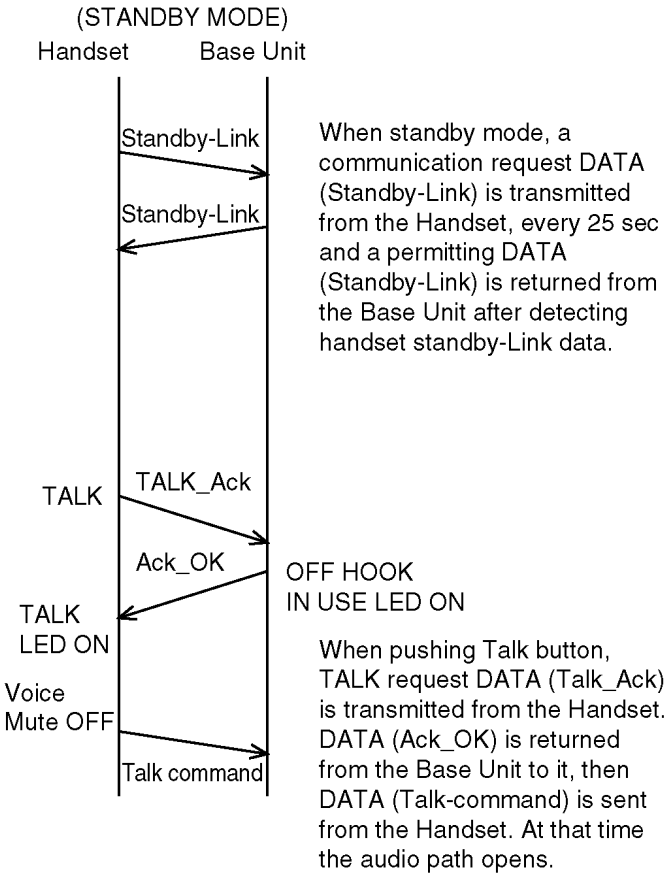


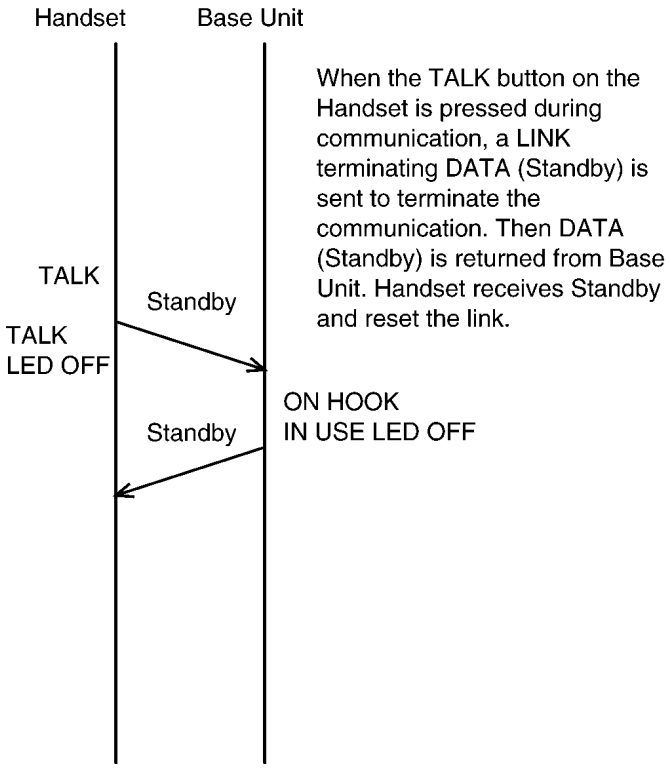
Fig. 9-2 HANDSET

8.5. EXPLANATION OF DSP DATA COMMUNICATION

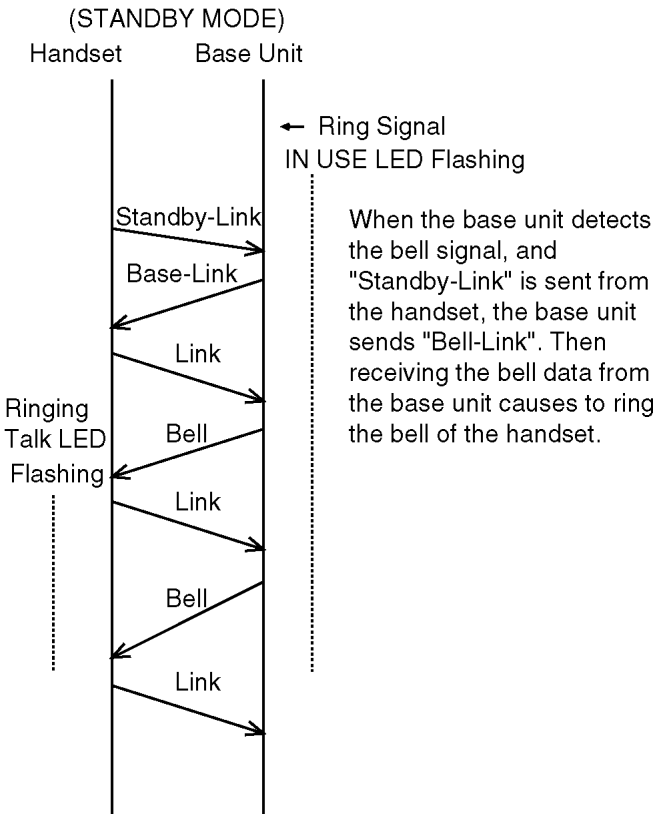
8.5.1. Calling



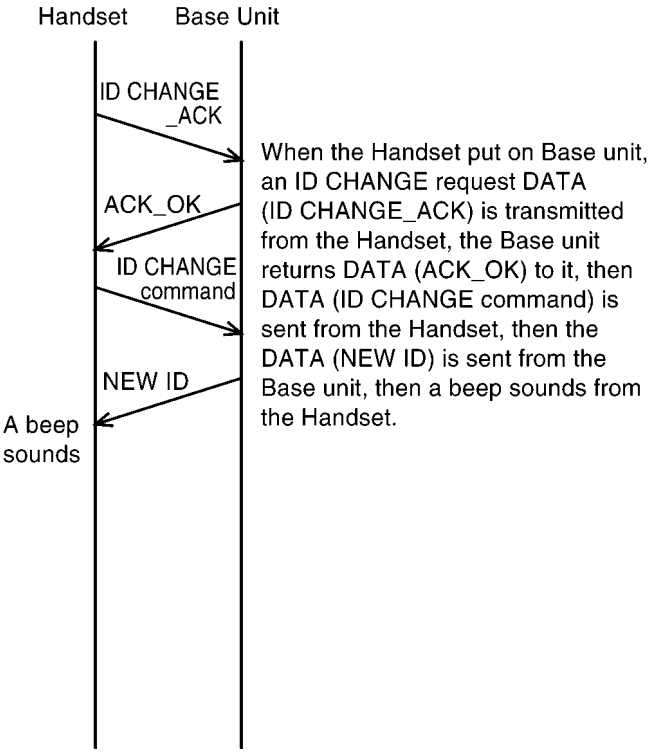
8.5.2. To Terminate Communication



8.5.3. Ringing

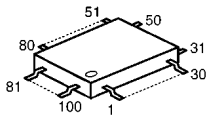
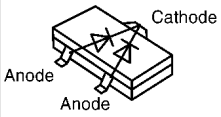
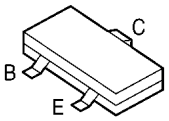
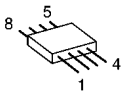
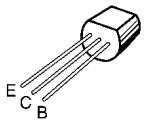
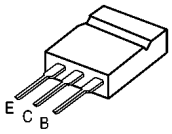
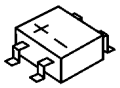
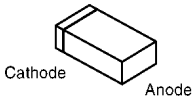
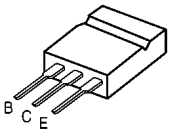
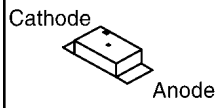
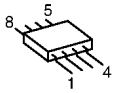
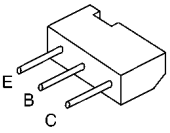
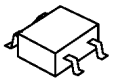
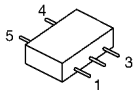
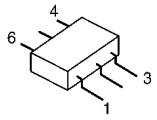


8.5.4. ID CHANGE

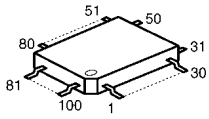
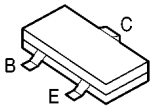
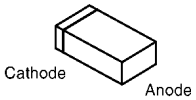
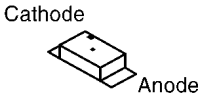
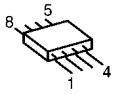
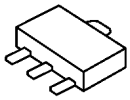
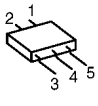
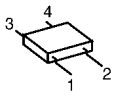


9 TERMINAL GUIDE OF IC´S, TRANSISTORS AND DIODES

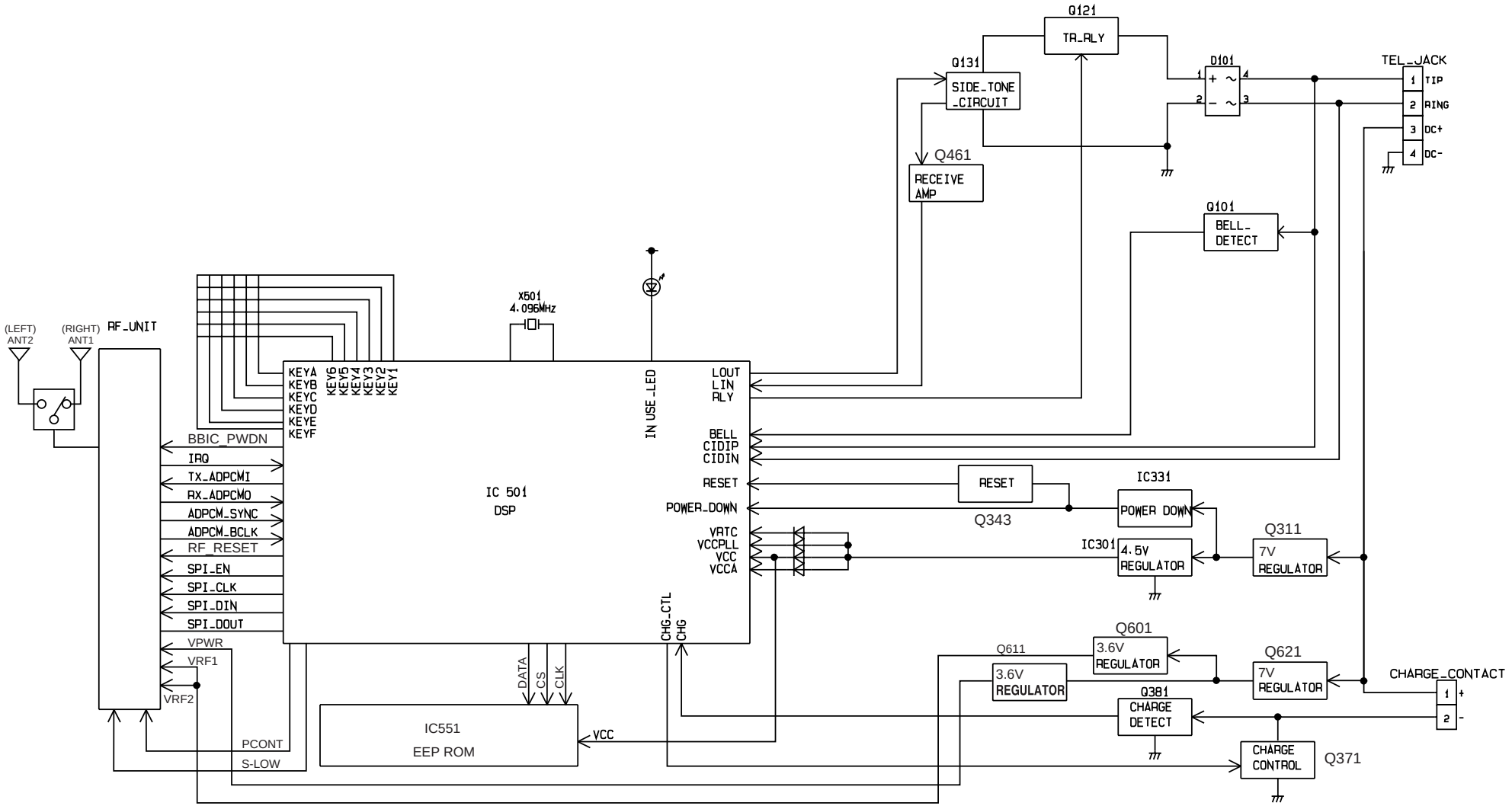
9.1. Base Unit

 PQVDRLZ2R0 PQVDRLZ20A	 C2HBBH000017	 MA153	 2SD1819A	 PQVIXCF4502P PQVITC7W74U	
 2SC2120 PQVT2N6517CA 2SA1625	 2SD2136	 PQVDS1ZB60F1	 PQVDHRU0203A MA8043, MA8082, MA111 MA8036H, MA8220, MA8075		 2SD2137
 LNJ308G8JRA	 PQWG2503CFH	 2SD1994A	 PQVIPS3432UT	 PQVITC7S08FU	 PQVISPM3204T

9.2. Handset

 C2HBBH000016	 PQVTD123T146, PQVTDTC143E PQVDTA143TU, 2SD1819A,UN521		 PQVD1SR154 MA2ZD1400 MA8150, MA111	 PQVDBR1111C PQVDSML310MT	 PQWIG2503CFR
 2SA1797Q	 PQVIXCP3302M	 PQVIC62FP33M	 PQVIC61CN32N		

10 BLOCK DIAGRAM (Base Unit)



11 CIRCUIT OPERATION (Base Unit)

11.1. Power Supply Circuit

Function:

Power from the AC adaptor passes through a regulating consisting of IC301.

Circuit Operation:

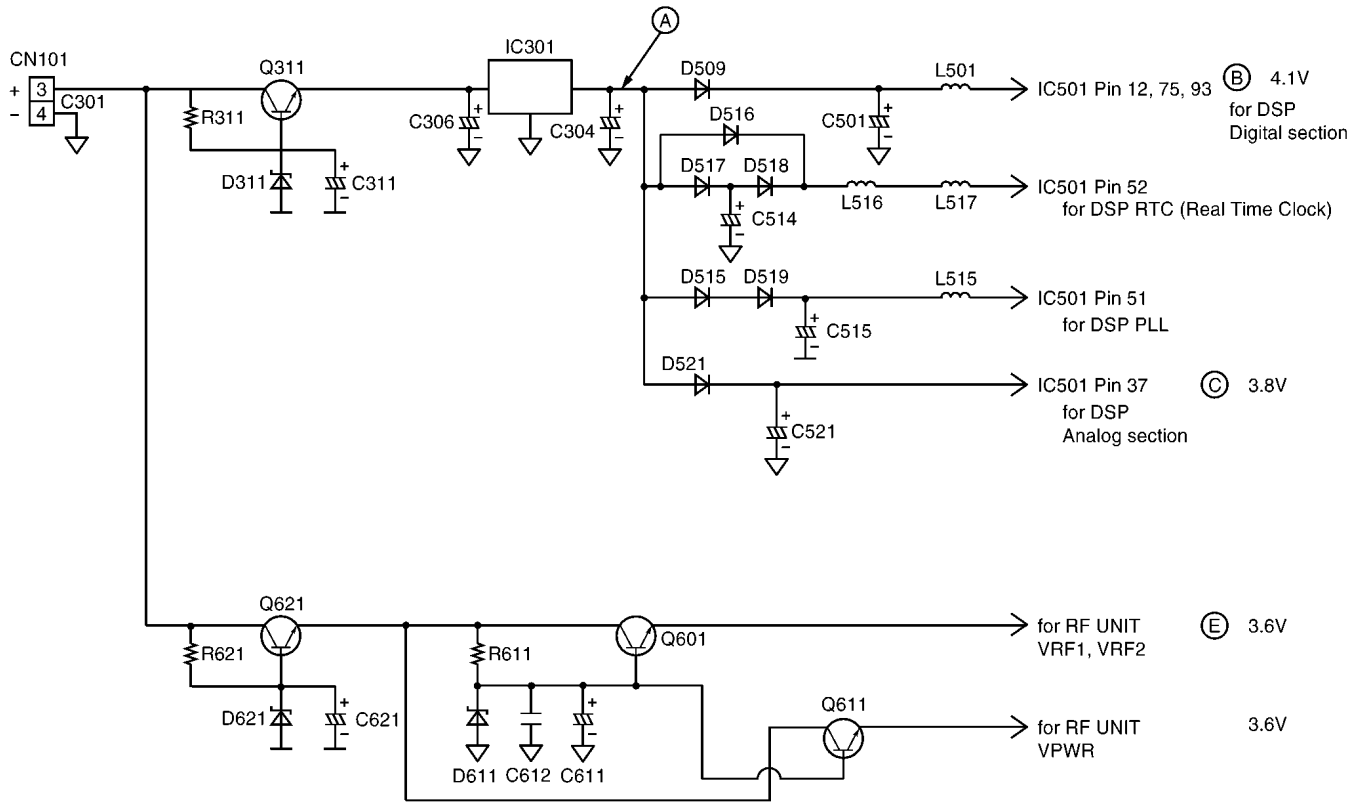
IC301 is a regulated power supply. The voltage at point A is regulated to 4.5 V by IC301.

The voltage at point B is dropped by D509 to 4.1 V.

The voltage at point C is dropped by D521 to 3.8 V.

The voltage at point E is dropped by Q601 to 3.6V

Circuit Diagram



11.2. DTMF Signal

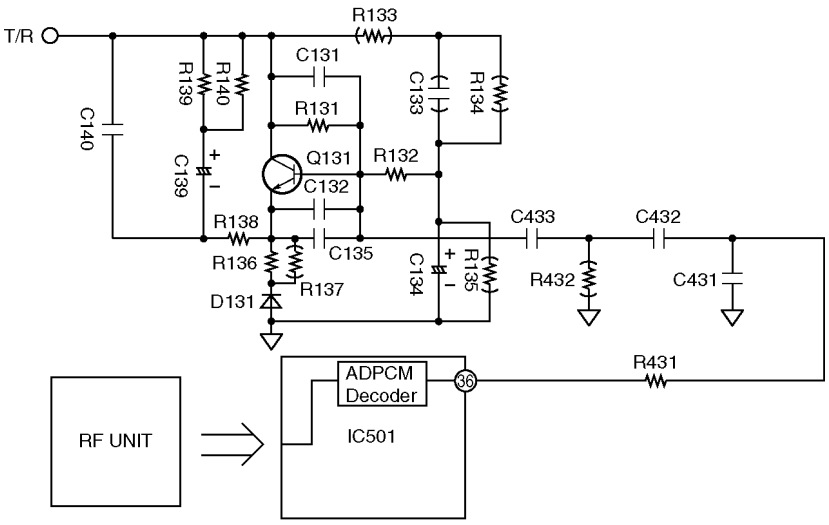
When the DTMF data from the Handset is received, the DTMF signal is output from pin 36 of IC501 and sent to the line through Q131.

11.3. Line Sending Signal

The coded signal input from the RF unit is decoded by IC501.

The audio signal output from IC501-36 is input to telephone line.

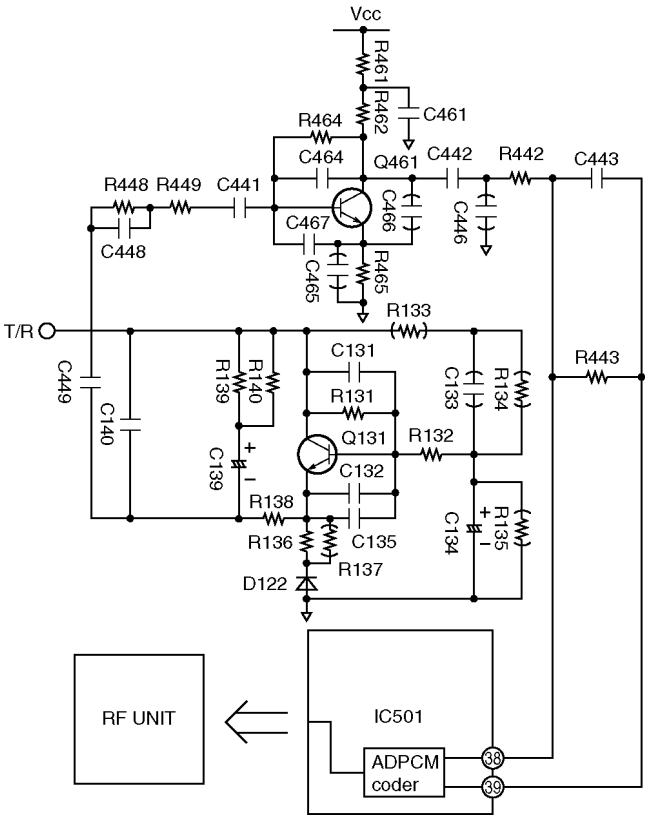
Circuit Diagram



11.4. Line Receiving Signal

The audio signal from line passes through Q131 and Q461 to pin 38 and 39 of IC501(DSP). IC501 modulates this input audio signal to output to the RF unit.

Circuit Diagram



11.5. Telephone Line Interface

Circuit Operation:

- **ANSWER**

  In the idle mode, Q121 is open to cut the DC loop current and decrease the ring load. When ring voltage appears at the Tip (T) and Ring (R) leads (When the telephone rings), the AC ring voltage is transferred as follows:

  T → L101 → R103 → C103 → Q101 → IC501 pin 64.

  When the CPU (DSP) detects a ring signal, Q121 turns on, thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow is for the voice signal.

  T → D101 → Q121 → Q131 → R139/R140 → C139 → RX

- **ON HOOK**

  Q121 is open, Q121 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

- **SPECIFICATIONS**

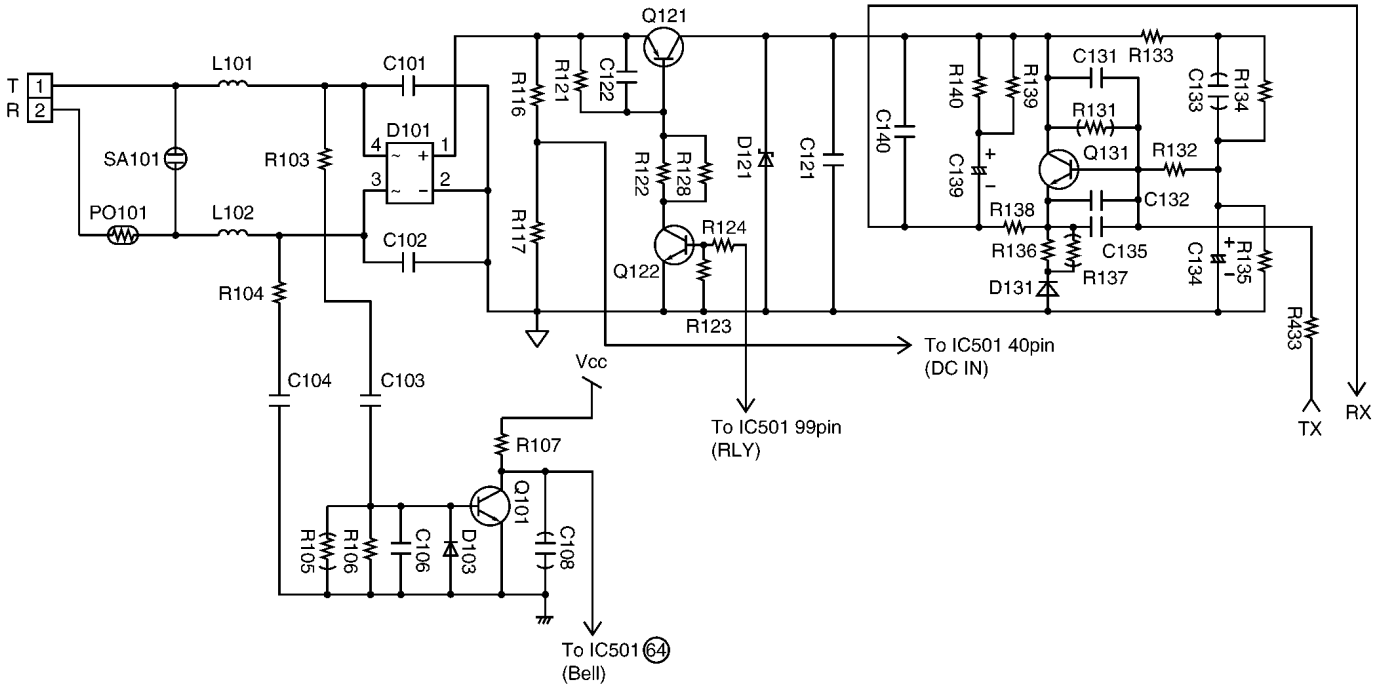
  In the on-hook state (idle), the current flows between the telephone line and the unit is as follows:

  T → L101 → R103 → C103 → R106 → C104 → R104 → L102 → PO101 → R.

  The DC component is blocked by C103, C104: thereby providing an on-hook condition.

  The AC interface impedance is over 47 kΩ; thus, satisfying the telephone company requirements.

Circuit Diagram



11.6. Initializing Circuit

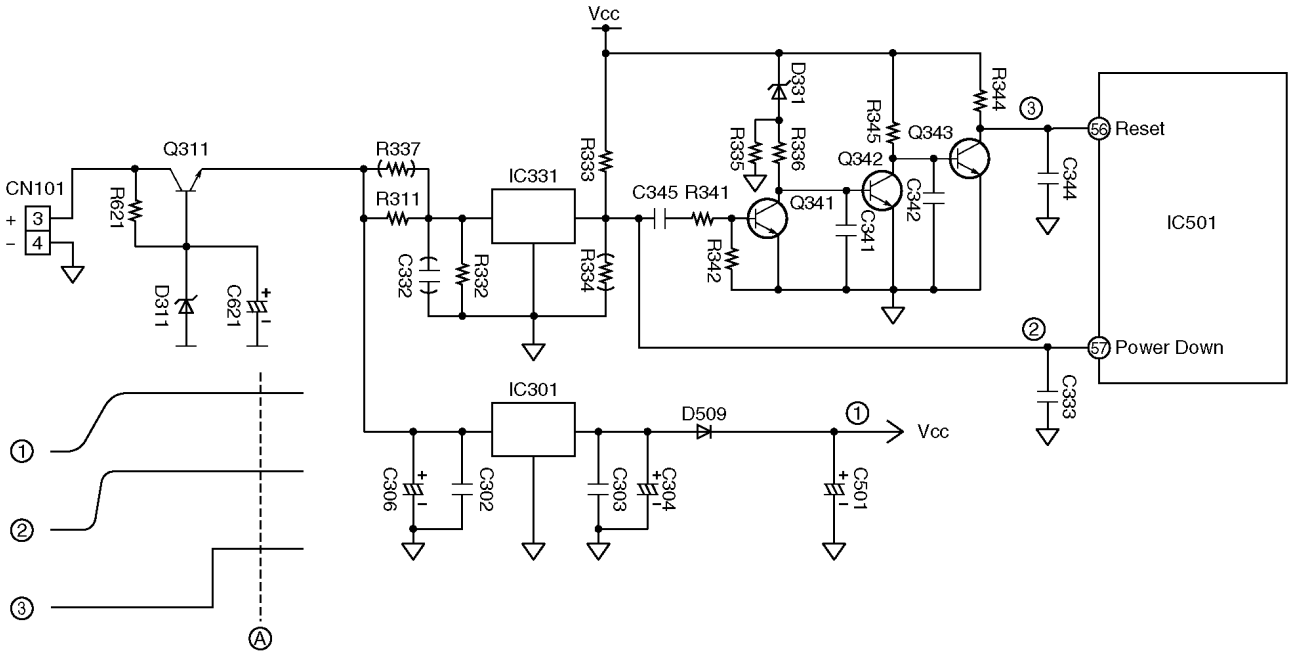
Function:

This circuit is used to initialize the microcomputer when it incorporates an AC adaptor.

Circuit Operation:

When the AC Adaptor is inserted into the unit, then the voltage is shifted by IC301, D509 and power is supplied to the DSP. The set can operate beyond point A in the circuit voltage diagram.

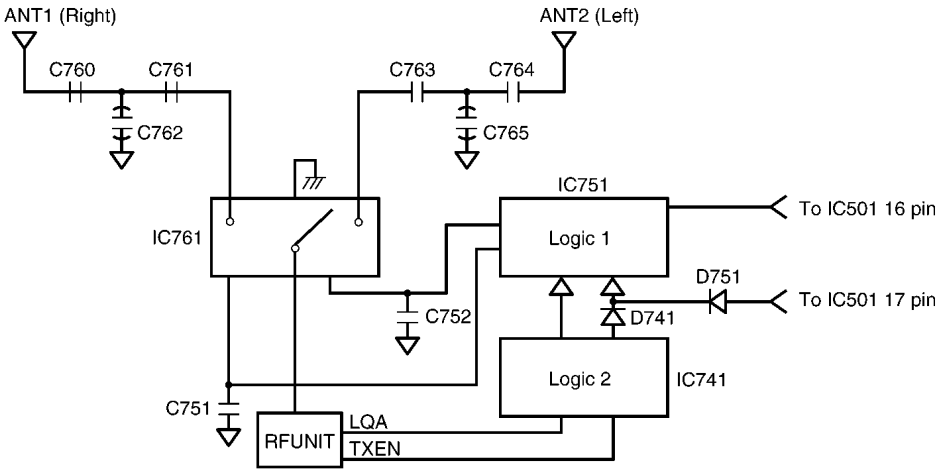
Circuit Diagram



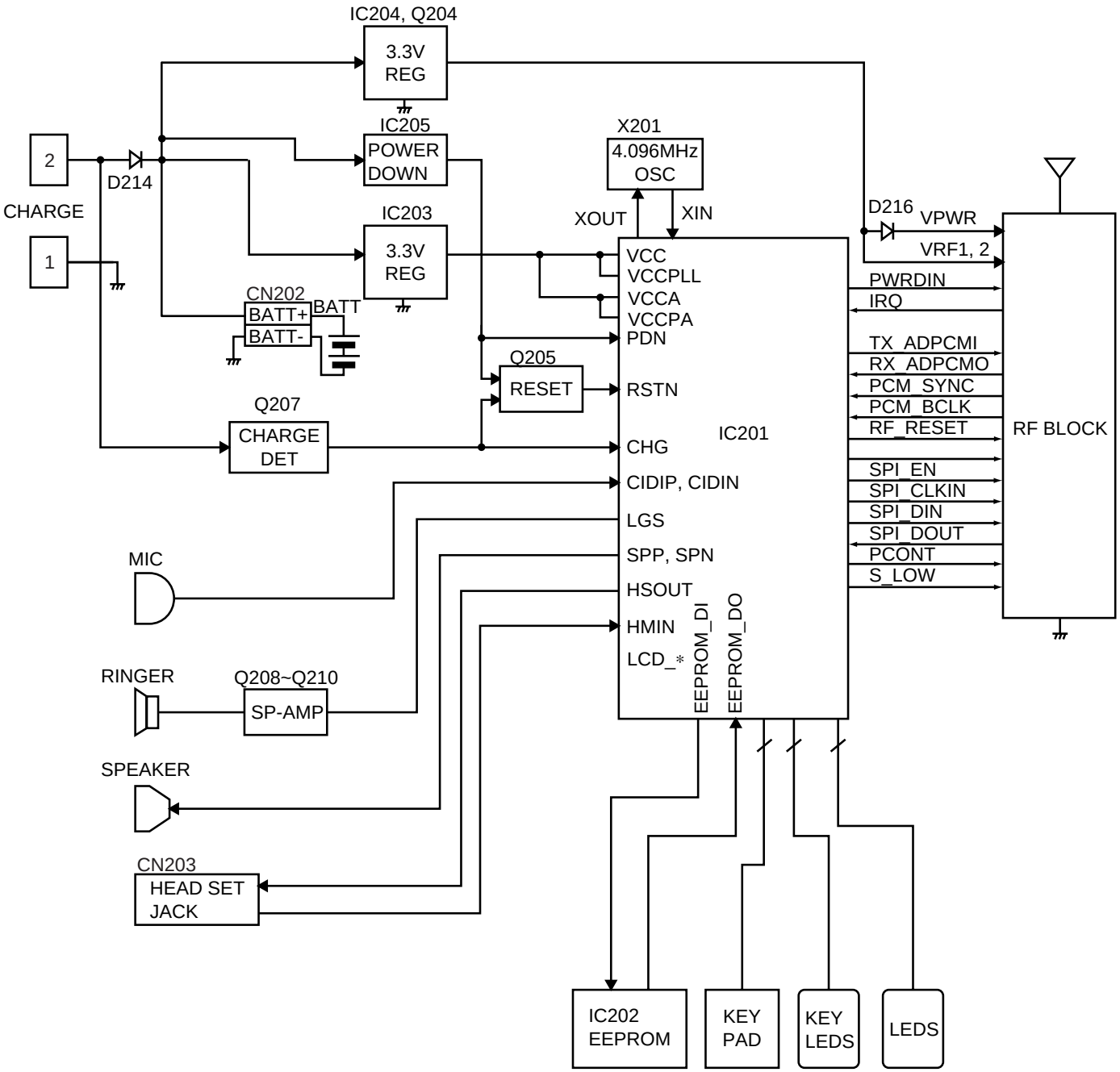
11.7. Antenna Diversity

Antenna Diversity improve conversation quality. This means to reduce some noise during conversation. RF unit send LQA (Link Quality Alarm) signal to IC751 when increase Error Bit's. Then IC751 control RF switch IC761 to switch another Antenna.

Antenna selection control by IC501 is available only in test mode.



12 BLOCK DIAGRAM (Handset)

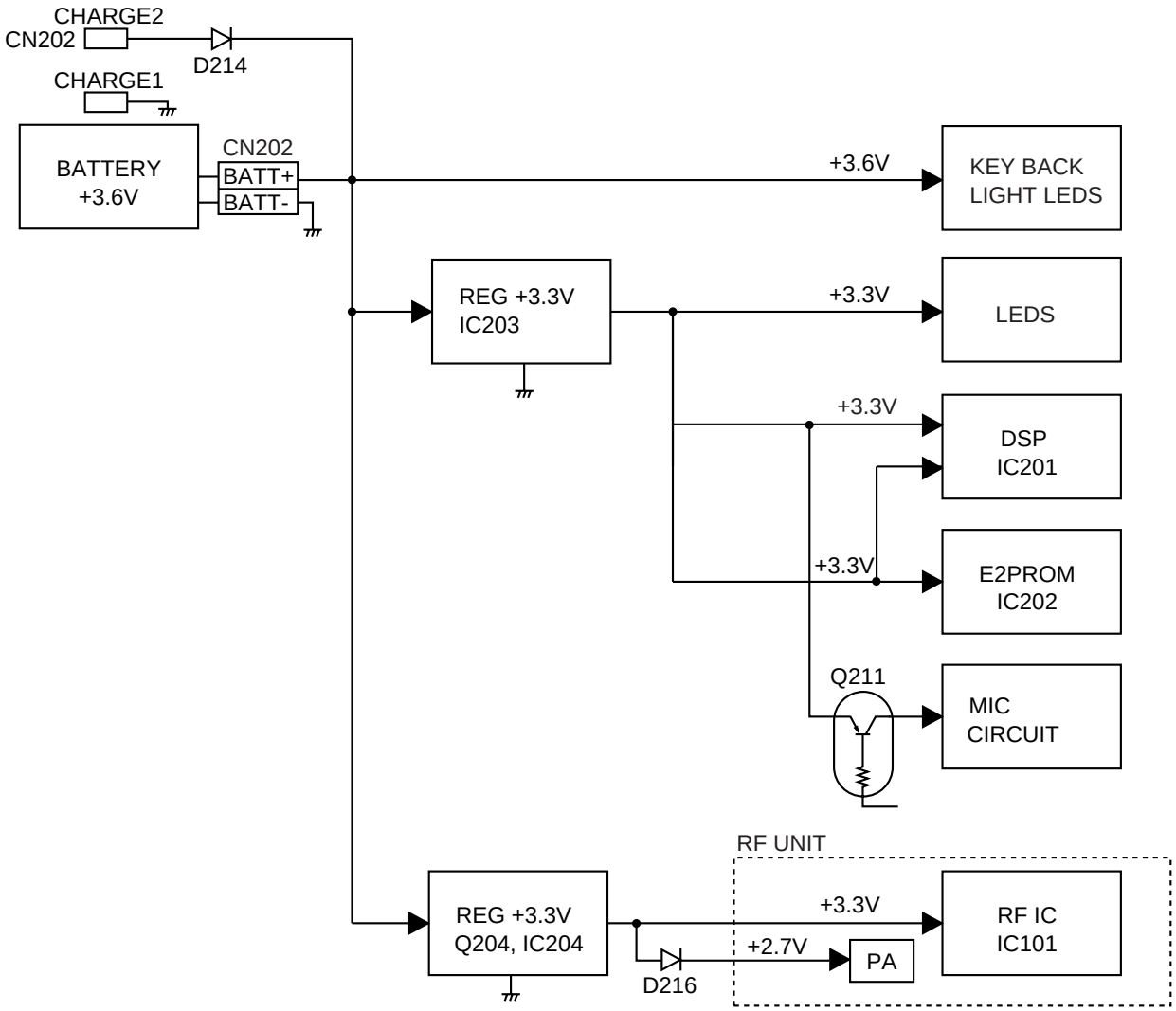


13 CIRCUIT OPERATION (Handset)

13.1. Power Supply Circuit

Voltage is supplied separately to each block.

Block Diagram (Handset Power)



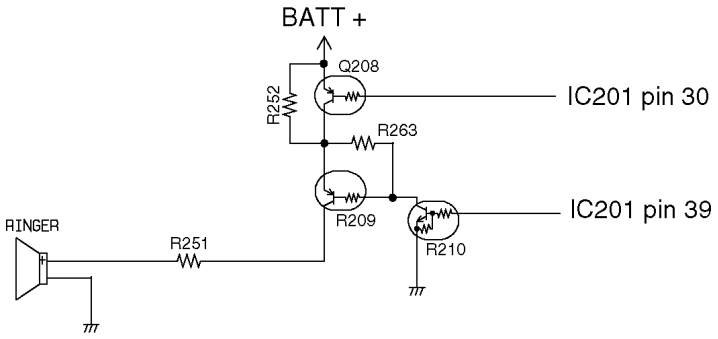
13.2. Charge Circuit

Ni-cd battery is connected to CN202. When the handset is put on the cradle of the base unit, the power is supplied from CHARGE1 and CHARGE2 terminals to charge the battery. Q207 detects the voltage of CHARGE1 and CHARGE2 terminals, then the handset makes ID code setting (*) with the base unit.

13.3. Ringer Circuit

If the ringer volume is set to low and an alarm tone is output from pin 39, IC201 DSP and input to Q209. Then Q208 is turned off. If the ringer volume is set to high, Q208 turns on and results in a louder beep tone.

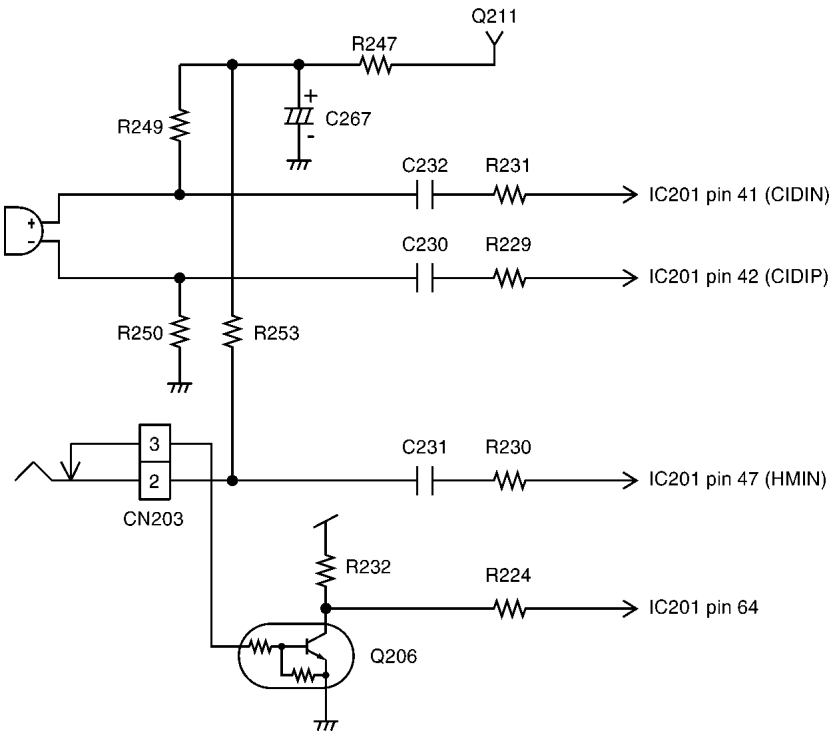
Circuit Diagram



13.4. Sending Signal

The voice signal from the microphone input to pin 42 (CIDIP) and pin 41(CIDIN) of IC201 (DSP). CN203 is the headphone jack. When the headphone is connected, the Q206 detect it. The input from the microphone of the handset (CIDIN, CIDIP) is cut and the microphone signal from the headphone is input to pin 47 of IC201 (HMIN). Also the power for the microphone is supplied from Q211, and the power is turned OFF on standby.

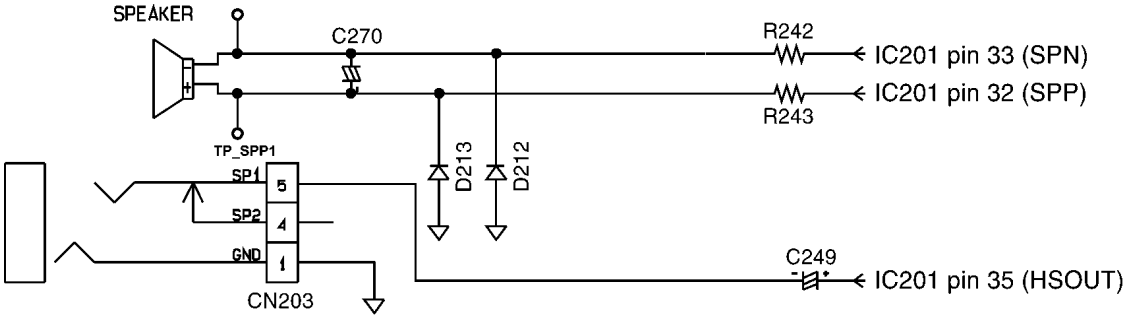
Circuit Diagram



13.5. Reception Signal Circuit

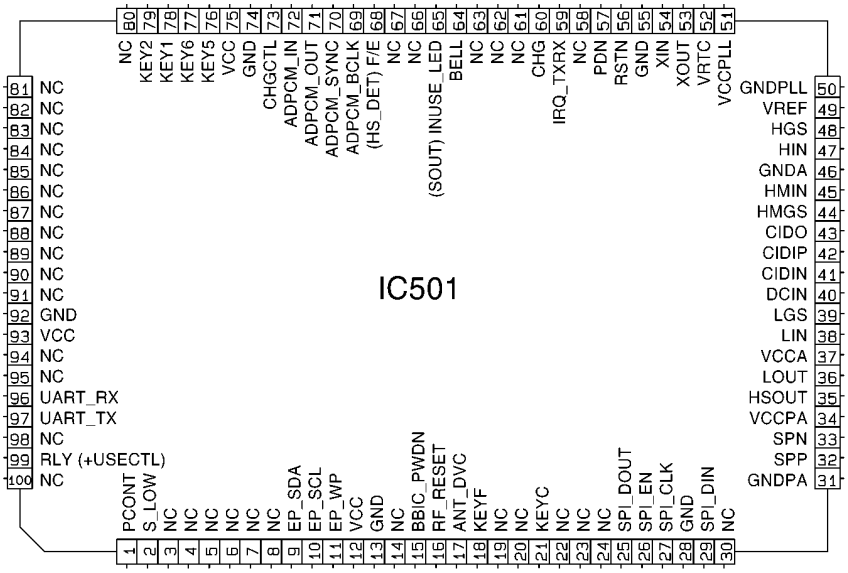
The received signal from the base unit is output from pins 33 (SPN) and 32 (SPP) of IC201 (DSP) as the voice signal. SPN is the inverse output of SPP, and the speaker is driven by SPN and SPP. CN203 is the headphone jack. When the headphone is connected to this jack, the output to the speaker of the handset (SPN,SPP) is cut and the voice signal is output to the headphone (HSOUT) only.

Circuit Diagram



14 CPU DATA (Base Unit)

14.1. IC501

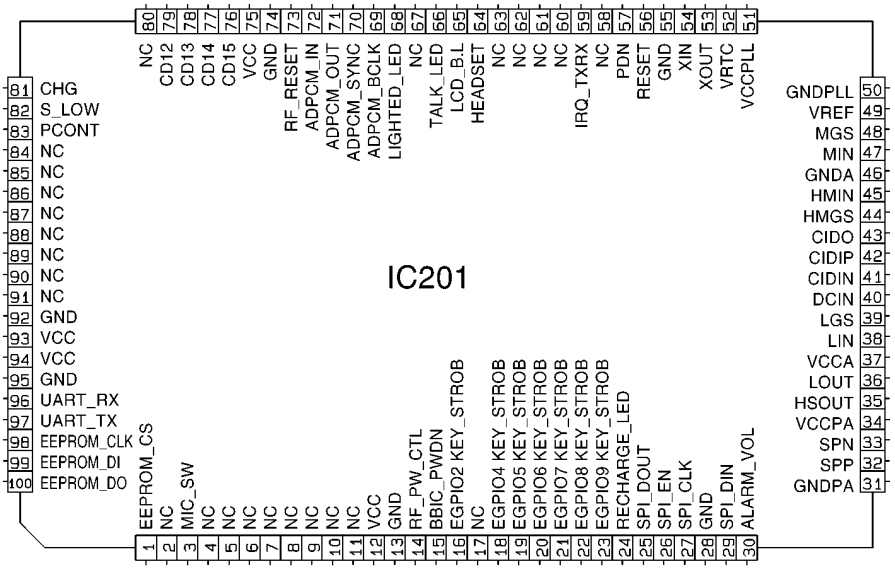


Pin	Description	I/O	High	Hi-z	Low
1	PCONT	D.O	pin2=Hi-z:High Power pin2=L: -	-	pin2=Hi-Z:Low Power pin2=L:Super Low Power
2	S_LOW	D.O	-	pin1=H:High Power pin1=L:Low Power	pin1=H: - pin1=L:Super Low Power
3	NC	D.O	-	-	-
4	NC	D.O	-	-	-
5	NC	D.O	-	-	-
6	NC	D.O	-	-	-
7	NC	D.O	-	-	-
8	NC	D.O	-	-	-
9	EP_SDA	I/O	High	-	Low
10	EP_SCL	D.O	High	-	Low
11	EP_WP	D.O	WP	-	Write
12	VCC	VCC	Vcc	-	-
13	GND	GND	-	-	GND
14	NC	D.O	-	-	-
15	BBIC_PWDN	D.O	Not	-	Active
16	RF_RESET	D.O	Normal	-	Reset
17	ANT_DVC	D.O	High	-	Low
18	KEYF	D.O	Active	Not	-
19	NC	D.O	Active	Not	-
20	NC	D.O	Active	Not	-
21	KEYC	D.O	Active	Not	-
22	NC	D.O	Active	Not	-
23	NC	D.O	Active	Not	-
24	NC	D.O	RLY Off	-	RLY On
25	SPI_DOUT	D.I	High	-	Low
26	SPI_EN	D.O	Not	-	Active
27	SPI_CLK	D.O	High	-	Low
28	GND	GND	-	-	GND
29	SPI_DIN	D.O	High	-	Low
30	NC	D.O	-	-	-
31	GNDPA	GND	-	-	GND
32	SPP	A.O	-	-	-
33	SPN	A.O	-	-	-
34	VCCPA	VCC	VCC	-	-
35	HSOUT	A.O	-	-	-
36	LOUT	A.O	-	-	-
37	VCCA	VCC	VCC	-	-
38	LIN	A.I	-	-	-
39	LGS	A.O	-	-	-
40	DCIN	A.I	-	-	-
41	CIDIN	A.I	-	-	-
42	CIDIP	A.I	-	-	-
43	CIDO	A.O	-	-	-
44	HMGS	A.O	-	-	-
45	HMIN	A.I	-	-	-
46	GNDA	GND	-	-	GND
47	HIN	A.I	-	-	-
48	HGS	A.O	-	-	-
49	VREF	A.O	-	-	-
50	GNDPLL	GND	-	-	GND

Pin	Description	I/O	High	Hi-z	Low
51	VCCPLL	VCC	VCC	-	-
52	VRTC	VCC	VCC	-	-
53	XOUT	A.O	-	-	-
54	XIN	A.I	-	-	-
55	GND	GND	-	-	GND
56	RSTN	D.I	Normal	-	Reset
57	PDN	D.I	Power On	-	Power Down
58	NC	D.O	-	-	-
59	IRQ_TXRX	D.I	Normal	-	Interrupt
60	CHG	D.I	Off charge	-	On Charge
61	NC	D.O	-	-	-
62	NC	D.O	-	-	-
63	NC	D.O	-	-	-
64	BELL	D.I	High	-	Low
65	(SOUT) INUSE_LED	D.O	Off	-	On
66	NC	D.O	-	-	-
67	NC	D.O	-	-	-
68	(HS_DET) F/E	D.I	32k	-	2k
69	ADPCM_BCLK	D.I	High	-	Low
70	ADPCM_SYNC	D.I	High	-	Low
71	ADPCM_OUT	D.I	High	-	Low
72	ADPCM_IN	D.O	High	-	Low
73	CHGCTL	D.O	-	Charge	Non Charge
74	GND	GND	-	-	GND
75	VCC	VCC	VCC	-	-
76	KEY5	D.I	Key In	-	Non
77	KEY6	D.I	Key In	-	Non
78	KEY1	D.I	Key In	-	Non
79	KEY2	D.I	Key In	-	Non
80	NC	D.I	-	-	-
81	NC	D.I	-	-	-
82	NC	D.O	-	-	-
83	NC	D.O	-	-	-
84	NC	D.O	-	-	-
85	NC	D.O	-	-	-
86	NC	D.O	-	-	-
87	NC	D.O	-	-	-
88	NC	D.O	-	-	-
89	NC	D.O	-	-	-
90	NC	D.O	-	-	-
91	NC	D.O	-	-	-
92	GND	GND	-	-	GND
93	VCC	VCC	VCC	-	-
94	NC	D.O	-	-	-
95	NC	D.O	-	-	-
96	UART_RX	D.I	High	-	Low
97	UART_TX	D.O	High	-	Low
98	NC	D.O	-	-	-
99	RLY (+USECTL)	D.O	On	-	Off
100	NC	D.O	Off	-	On

15 CPU DATA (Handset)

15.1. IC201

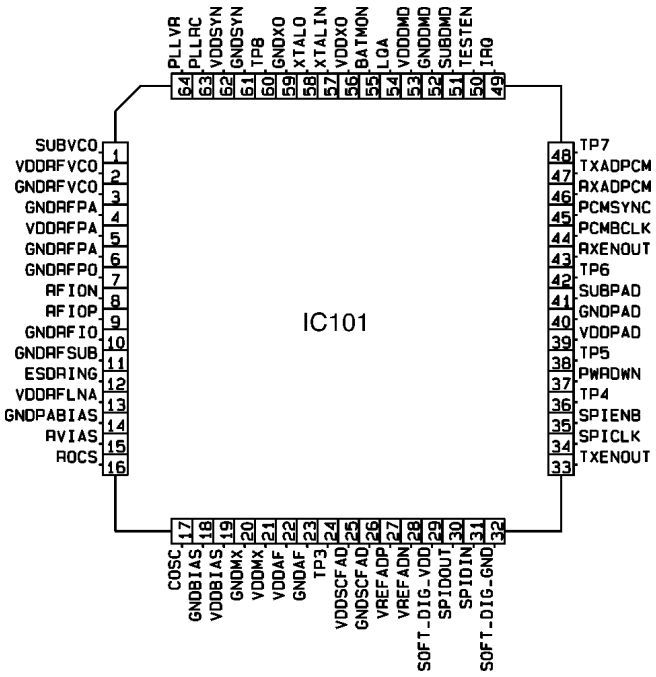


Pin	Description	I/O	High	Hi-z	Low
1	EEPROM_CS	D.O	Active	-	Not
2	NC	D.O	-	-	-
3	MIC_SW	D.O	Bias Off	-	Bias On
4	NC	D.O	-	-	-
5	NC	D.O	-	-	-
6	NC	D.O	-	-	-
7	NC	D.O	-	-	-
8	NC	D.O	-	-	-
9	NC	D.O	-	-	-
10	NC	D.O	-	-	-
11	NC	D.O	-	-	-
12	VCC	VCC	Vcc	-	-
13	GND	GND	-	-	GND
14	RF_PW_CTL	D.O	Off	-	On
15	BBIC_PWDN	D.O	Not	-	Active
16	EGPIO2 KEY_STROB	D.O	Active	Not	-
17	NC	D.O	-	-	-
18	EGPIO4 KEY_STROB	D.O	Active	Not	-
19	EGPIO5 KEY_STROB	D.O	Active	Not	-
20	EGPIO6 KEY_STROB	D.O	Active	Not	-
21	EGPIO7 KEY_STROB	D.O	Active	Not	-
22	EGPIO8 KEY_STROB	D.O	Active	Not	-
23	EGPIO9 KEY_STROB	D.O	Active	Not	-
24	RECHARGE_LED	D.O	Off	-	-
25	SPI_DOUT	D.I	High	-	Low
26	SPI_EN	D.O	Not	-	Active
27	SPI_CLK	D.O	High	-	Low
28	GND	-	-	-	GND
29	SPI_DIN	D.O	High	-	Low
30	ALARM_VOL	D.O	Off	-	On
31	GNDPA	GND	-	-	GND
32	SPP	A.O	-	-	-
33	SPN	A.O	-	-	-
34	VCCPA	VCC	VCC	-	-
35	HSOUT	A.O	-	-	-
36	LOUT	A.O	-	-	-
37	VCCA	VCC	VCC	-	-
38	LIN	A.I	-	-	-
39	LGS	A.O	-	-	-
40	DCIN	A.I	-	-	-
41	CIDIN	A.I	-	-	-
42	CIDIP	A.I	-	-	-
43	CIDO	A.O	-	-	-
44	HMGS	A.O	-	-	-
45	HMIN	A.I	-	-	-
46	GNDA	GND	-	-	GND
47	MIN	A.I	-	-	-
48	MGS	A.O	-	-	-
49	VREF	A.O	-	-	-
50	GNDPLL	GND	-	-	GND

Pin	Description	I/O	High	Hi-z	Low
51	VCCPLL	VCC	VCC	-	-
52	VRTC	VCC	VCC	-	-
53	XOUT	A.O	-	-	-
54	XIN	A.I	-	-	-
55	GND	GND	-	-	GND
56	RESET	D.I	Normal	-	Reset
57	PDN	D.I	Power On	-	Power Down
58	NC	D.O	-	-	Normal
59	IRQ_TXRX	D.I	Normal	-	Interrupt
60	NC	D.O	-	-	Normal
61	NC	D.O	-	-	Normal
62	NC	D.O	-	-	Normal
63	NC	D.O	-	-	Normal
64	HEADSET	D.I	Headset In	-	Non
65	LCD_B.L	D.O	On	-	Off
66	TALK_LED	D.O	Off	-	-
67	NC	D.O	-	-	Normal
68	LIGHTED_LED	D.O	On	-	Off
69	ADPCM_BCLK	D.I	High	-	Low
70	ADPCM_SYNC	D.I	High	-	Low
71	ADPCM_OUT	D.I	High	-	Low
72	ADPCM_IN	D.O	High	-	Low
73	RF_RESET	D.O	Normal	-	Reset
74	GND	GND	-	-	GND
75	VCC	VCC	VCC	-	-
76	CD15	D.I	Key In	-	Non
77	CD14	D.I	Key In	-	Non
78	CD13	D.I	Key In	-	Non
79	CD12	D.I	Key In	-	Non
80	NC	D.O	-	-	Normal
81	CHG	D.I	Off Charge	-	On Charge
82	S_LOW	D.O	-	Pin 83 = H: High Power Pin 83 = L: -	P 82 = Hi-z: Low Power P 82 = L: Super Low Power
83	PCONT	D.O	Pin 82 = Hi-z: High Power Pin 82 = L: Super Low Power	-	Super Low Power
84	NC	D.O	-	-	Normal
85	NC	D.O	-	-	Normal
86	NC	D.O	-	-	Normal
87	NC	D.O	-	-	Normal
88	NC	D.O	-	-	Normal
89	NC	D.O	-	-	Normal
90	NC	D.O	-	-	Normal
91	NC	D.O	-	-	Normal
92	GND	GND	-	-	GND
93	VCC	VCC	VCC	-	-
94	VCC	VCC	VCC	-	-
95	GND	GND	-	-	GND
96	UART_RX	D.I	High	-	Low
97	UART_TX	D.O	High	-	Low
98	EEPROM_CLK	D.O	High	-	Low
99	EEPROM_DI	D.O	High	-	Low
100	EEPROM_DO	D.I	High	-	Low

16 EXPLANATION OF IC TERMINALS (RF Unit, Base Unit)

16.1. IC101



Pin	Description	I/O
1	SUBVCO	GND
2	VDDRFVCO	VCC
3	GNDRFVCO	GND
4	GNDRFPA	GND
5	VDDRFPA	VCC
6	GNDRFPA	GND
7	GNDRFPO	GND
8	RF ION	I/O
9	RF IOP	I/O
10	GNDRFIO	GND
11	GNDRFSUB	GND
12	ESDRING	GND
13	VDDRFLNA	VCC
14	GNDPABIAS	GND
15	RBIAS	I
16	ROCS	I
17	COSC	I
18	GNDBIAS	GND
19	VDDBIAS	VCC
20	GNDMX	GND
21	VDDMX	VCC
22	VDDAF	VCC
23	GNDAF	GND
24	TP3	O
25	VDDSCFAD	VCC
26	GNDSCFAD	GND
27	VREFADP	VCC
28	VREFADN	I
29	SOFT_DIG_VDD	VCC
30	SPIDOUT	D.O
31	SPIDIN	D.I
32	SOFT_DIG_GND	GND

Pin	Description	I/O
33	TXENOUT	D.O
34	SPICLK	D.I
35	SPIENB	D.I
36	RESET	D.I
37	PWRDWN	D.I
38	MCLKOUT	O
39	VDDPAD	VCC
40	GNDPAD	GND
41	SUBPAD	GND
42	TP6	D.O
43	RXENOUT	D.O
44	PCMBCLK	D.O
45	PCMSYNC	D.O
46	RXADPCM	D.O
47	TXADPCM	D.I
48	TP7	D.O
49	IRQ	D.O
50	TESTEN	D.I
51	XUBDMD	GND
52	GNDDMD	GND
53	VDDDMD	VCC
54	LQA	D.O
55	BATMON	I
56	VDDXO	VDD
57	XTALIN	I
58	XTALO	O
59	GNDXO	GND
60	TP8	D.I
61	GNDSYN	GND
62	VDDSYN	VCC
63	PLLRC	O
64	PLLVR	I

17 HOW TO REPLACE FLAT PACKAGE IC

17.1. Preparation

- SOLDER

  Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19, KR-19RMA

- Soldering iron

  Recommended power consumption will be between 30 W to 40 W.

  Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)

  (An expert may handle between 60 W to 80 W iron, but beginner might damage foil by overheating.)

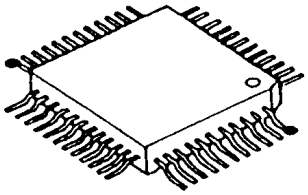
- Flux

  HI115 Specific gravity 0.863

  (Original flux will be replaced daily.)

17.2. Procedure

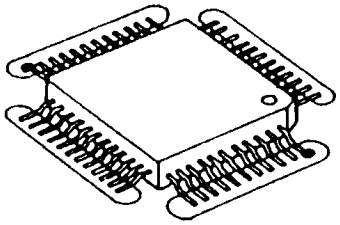
1. Temporary fix FLAT PACKAGE IC by soldering on two marked 2 pins.



● - - - - - - Temporary soldering point.

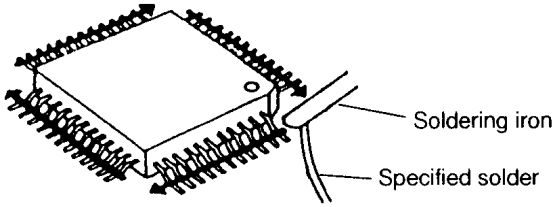
*Most important matter is accurate setting of IC to the corresponding soldering foil.

2. Apply flux for all pins of FLAT PACKAGE IC.



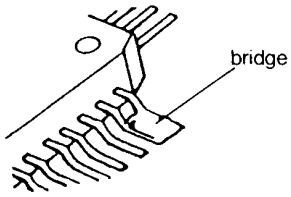
- - - - - - Flux

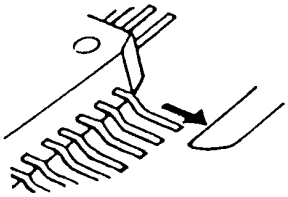
3. Solder employing specified solder to direction of arrow, as sliding the soldering iron.



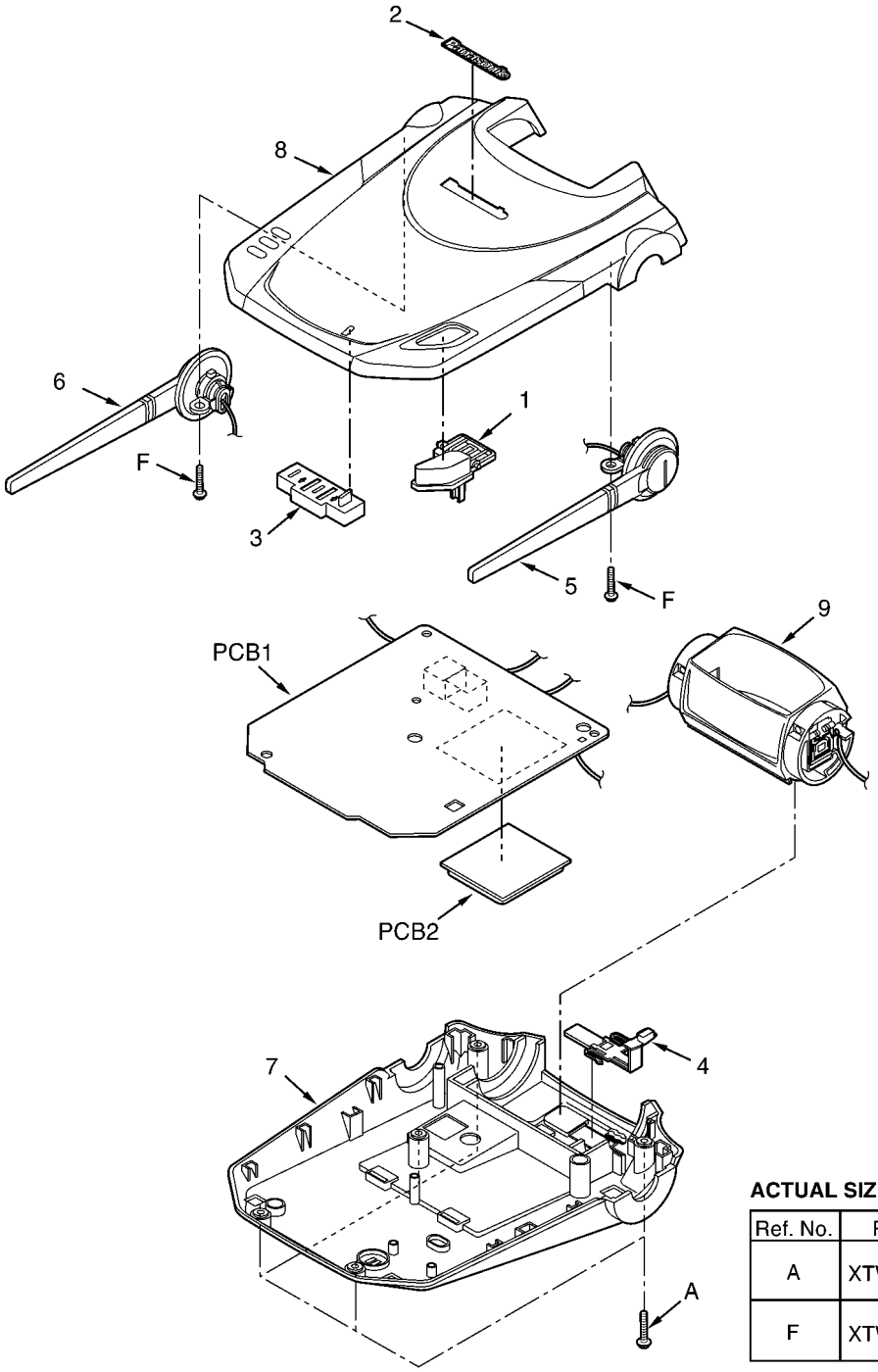
17.3. Modification Procedure of Bridge

1. Re-solder slightly on bridged portion.
2. Remove remained solder along pins employing soldering iron as shown in below figure.





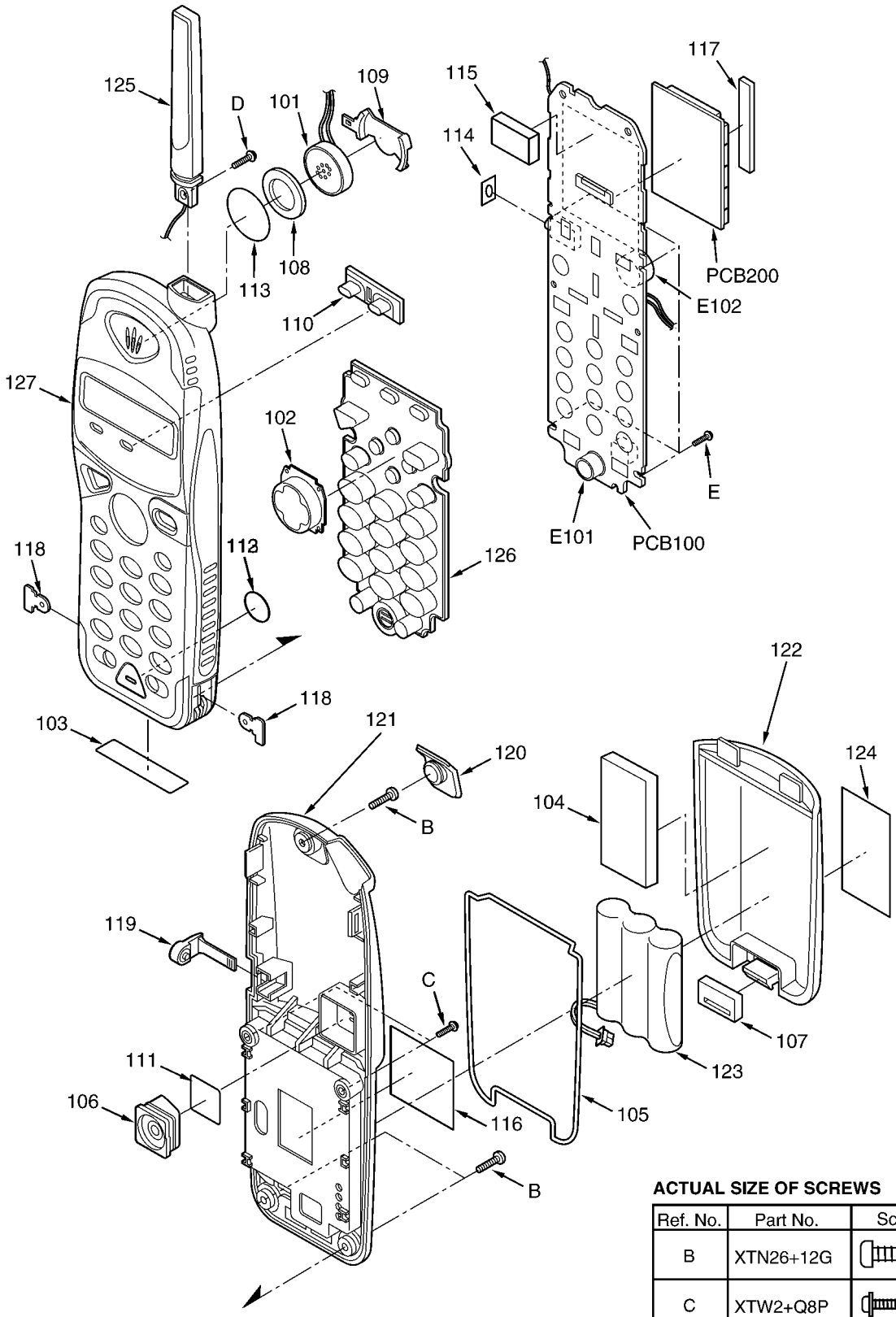
18 CABINET AND ELECTRICAL PARTS (Base Unit)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
A	XTW26+14P	
F	XTW26+14P	

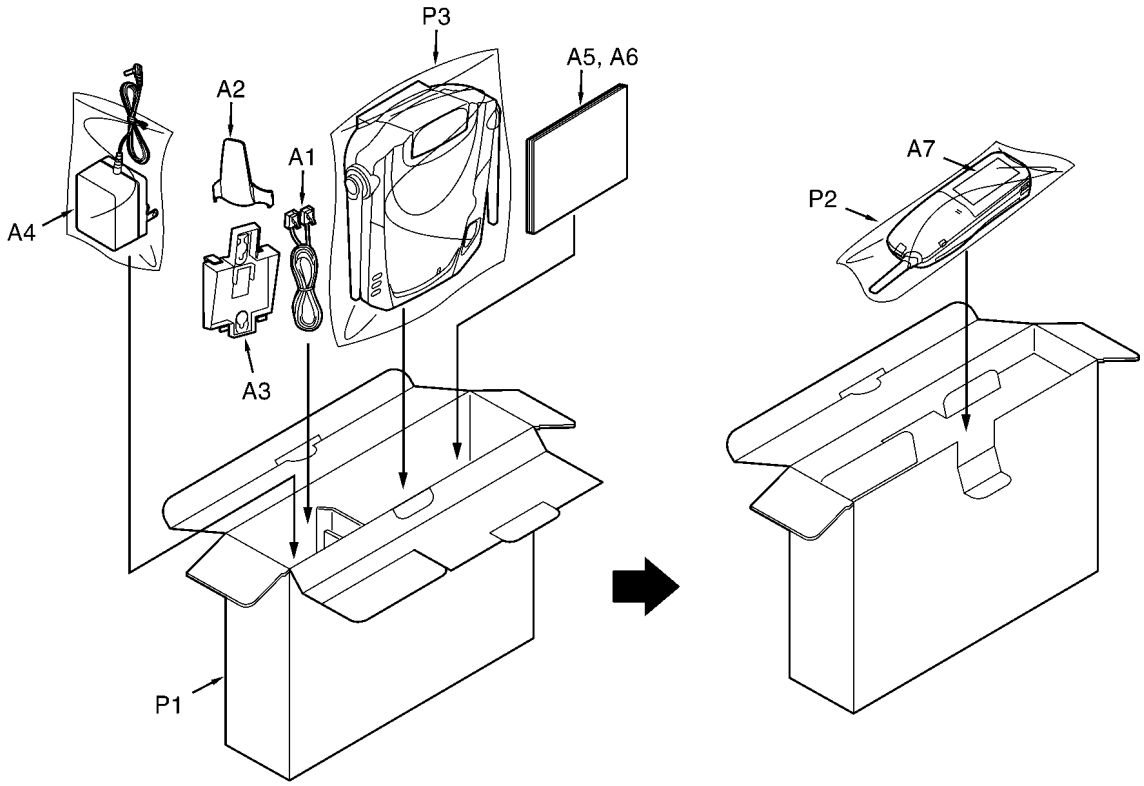
19 CABINET AND ELECTRICAL PARTS (Handset)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
B	XTN26+12G	
C	XTW2+Q8P	
D	XTW26+12P	
E	XTW2+Q8P	

20 ACCESSORIES AND PACKING MATERIALS



21 REPLACEMENT PARTS LIST

This replacement parts list are Canada version only.

Note:

1. RTL (Retention Time Limited)

   The marking (RTL) indicates that the Retention Time is limited for this item.

   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention.

   After the end of this period, the assembly will no longer be available.

2. Important safety notice

   Components identified by a ⚠ mark special characteristics important for safety. When replacing any of these components, use only manufacture´s specified parts.

3. The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS

   Unless otherwise specified;

   All resistors are in ohms (Ω) K=1000Ω, M=1000kΩ

   All capacitors are in MICRO FARADS (µF) P=µµF

   *Type & Wattage of Resistor

Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattege

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

21.1. Base Unit

21.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQBC10333Z1	LOCATOR BUTTON	S
2	PQGB7Y	BADGE	
3	PQHR10845Y	LED LENS/ RUBBER	
4	PQKE10333Z1	HOOK LEVER	S
5	PQSA10109Y	ANTENNA	
6	PQSA10110Y	ANTENNA	
7	PQYF10195W1	LOWER CABINET	S
8	PQYM10111Y3	UPPER CABINET	S
9	PQZHTG2583BH	CHARGE CASE ASS´Y	

21.1.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWPG2503CFH	MAIN P.C BOARD ASS´Y (RTL)	
		(ICS)	
IC301	PQVIXCF4502P	IC	S
IC331	PQVIPS3432UT	IC	S
IC501	C2HBBH000017	IC	
IC551	PQWIG2503CFH	IC	
IC741	PQVITC7S08FU	IC	S
IC751	PQVITC7W74U	IC	S
IC761	PQVISPM3204T	IC	S
		(TRANSISTORS)	
Q101	2SD1819A	TRANSISTOR(SI)	
Q121	2SA1625	TRANSISTOR(SI)	S
Q122	PQVT2N6517CA	TRANSISTOR(SI)	S
Q131	2SC2120	TRANSISTOR(SI)	S
Q311	2SD2136	TRANSISTOR(SI)	
Q321	2SD1819A	TRANSISTOR(SI)	
Q341	2SD1819A	TRANSISTOR(SI)	
Q342	2SD1819A	TRANSISTOR(SI)	
Q343	2SD1819A	TRANSISTOR(SI)	
Q371	2SD2136	TRANSISTOR(SI)	
Q381	2SD1819A	TRANSISTOR(SI)	
Q445	2SD1819A	TRANSISTOR(SI)	
Q461	2SD1819A	TRANSISTOR(SI)	
Q551	2SD1819A	TRANSISTOR(SI)	
Q601	2SD1994A	TRANSISTOR(SI)	
Q611	2SD1994A	TRANSISTOR(SI)	
Q621	2SD2137	TRANSISTOR(SI)	
		(DIODES)	
D101	PQVDS1ZB60F1	DIODE(SI)	S
D103	MA111	DIODE(SI)	
D121	PQVDRLZ20A	DIODE(SI)	S
D131	PQVDRLZ2R0	DIODE(SI)	S
D311	MA8075	DIODE(SI)	
D321	MA111	DIODE(SI)	
D331	MA8036H	DIODE(SI)	
D371	MA111	DIODE(SI)	
D376	MA8220	DIODE(SI)	
D377	MA8220	DIODE(SI)	
D445	MA153	DIODE(SI)	
D509	PQVDHRU0203A	DIODE(SI)	S
D515	MA111	DIODE(SI)	
D519	MA111	DIODE(SI)	
D521	PQVDHRU0203A	DIODE(SI)	S
D611	MA8043	DIODE(SI)	
D621	MA8082	DIODE(SI)	
D741	MA111	DIODE(SI)	
D751	MA111	DIODE(SI)	
		(LED)	
LED541	LNJ308G8JRA	LED	
		(COILS)	
L101	PQLQXF330K	COIL	S
L102	PQLQXF330K	COIL	S
L501	PFVF2P221SG	COIL	
L515	PQLQR2K1A102	COIL	
		(SURGE ABSORBERS)	
SA101	PQVDDSS301L	SURGE ABSORBER	
SA102	PQVDDSS301L	SURGE ABSORBER	
		(OTHERS)	
S546	EVQPC005K	PUSH SWITCH	
CN101	PQJJ2H003Z	DC-TEL	S
P101	PQRPAR390N	POSISTOR	S
X501	PQVCK4096N9Z	CRYSTAL OSCILLATOR	S
G601	PQJT10152Z	CHARGE TERMINAL	
G602	PQJT10152Z	CHARGE TERMINAL	
G603	PQJT10152Z	CHARGE TERMINAL	

Ref. No.	Part No.	Part Name & Description	Remarks
G604	PQJT10152Z	CHARGE TERMINAL	
G605	PQJT10152Z	CHARGE TERMINAL	
G606	PQJT10152Z	CHARGE TERMINAL	
		(RESISTORS)	
R103	ERJ3GEYJ104	100k	
R104	ERJ3GEYJ104	100k	
R106	ERJ3GEYJ472	4.7k	
R107	ERJ3GEYJ473	47k	
R121	ERJ3GEYJ104	100k	
R122	ERJ3GEYJ103	10k	
R123	ERJ3GEYJ153	15k	
R124	ERJ3GEYJ473	47k	
R128	ERJ3GEYJ103	10k	
R132	ERJ3GEYJ393	39k	
R133	ERJ3GEYJ102	1k	
R134	ERJ3GEY0R00	0	
R136	ERDS1TJ330	33	S
R138	ERJ3GEYJ470	47	
R139	ERJ3GEYJ122	1.2k	
R140	ERJ3GEYJ821	820	
R311	ERD25TJ221	220	S
R331	ERJ3GEYJ273	27k	
R332	ERJ3GEYJ683	68k	
R333	ERJ3GEYJ103	10k	
R335	ERJ3GEYJ561	560	
R336	ERJ3GEYJ563	56k	
R341	ERJ3GEYJ473	47k	
R342	ERJ3GEYJ224	220k	
R344	ERJ3GEYJ104	100k	
R345	ERJ3GEYJ224	220k	
R371	ERJ3GEYJ121	120	
R372	ERJ3GEYJ561	560	
R373	ERJ3GEYJ390	39	
R374	ERJ3GEYJ220	22	
R375	ERJ3GEYJ220	22	
R376	ERJ3GEYJ220	22	
R377	ERDS1TJ221	220	S
R378	ERDS1TJ221	220	S
R381	ERJ3GEYJ563	56k	
R382	ERJ3GEYJ563	56k	
R383	ERJ3GEYJ103	10k	
R384	ERJ3GEYJ104	100k	
R415	ERJ3GEYJ473	47k	
R431	ERJ3GEYJ222	2.2k	
R433	ERJ3GEYJ393	39k	
R442	ERJ3GEYJ682	6.8k	
R443	ERJ3GEYJ103	10k	
R444	ERJ3GEYJ332	3.3k	
R445	ERJ3GEYJ564	560k	
R446	ERJ3GEYJ105	1M	
R447	ERJ3GEYJ151	150	
R448	ERJ3GEYJ222	2.2k	
R449	ERJ3GEYJ102	1k	
R451	ERJ3GEYJ103	10k	
R461	ERJ3GEYJ150	15	
R462	ERJ3GEYJ392	3.9k	
R464	ERJ3GEYJ474	470k	
R465	ERJ3GEYJ390	39	
R516	ERJ3GEY0R00	0	
R521	ERJ3GEY0R00	0	
R541	ERJ3GEYJ151	150	
R546	ERJ3GEYJ472	4.7k	
R551	ERJ3GEYJ274	270k	
R553	ERJ3GEYJ103	10k	
R554	ERJ3GEYJ103	10k	
R579	ERJ3GEYJ104	100k	
R593	ERJ3GEYJ472	4.7k	
R611	ERJ3GEYJ221	220	
R621	ERJ3GEYJ471	470	
R658	ERJ3GEYJ180	18	
R659	ERJ3GEYJ221	220	
R660	ERJ3GEYJ821	820	
R664	ERJ3GEYJ180	18	
R666	ERJ3GEYJ180	18	
R751	ERJ3GEYJ103	10k	
R753	ERJ3GEYJ104	100k	
R754	ERJ3GEYJ104	100k	
C452	ERJ3GEY0R00	0	
		(CAPACITORS)	
C101	ECKD2H681KB	680p	S
C102	ECKD2H681KB	680p	S
C103	PQCUV1H154KR	0.15	
C104	PQCUV1H154KR	0.15	
C106	PQCUV1A684KB	0.68	
C121	ECUV1H103KBV	0.01	
C131	ECUV1H101JCV	100p	
C132	ECUV1H103KBV	0.01	
C134	ECEA1HKS100	10	S
C139	ECEA1CKA100	10	
C140	ECUV1C473KBV	0.047	
C301	ECUV1H103KBV	0.01	
C302	ECUV1C104ZFV	0.1	
C303	ECUV1C104ZFV	0.1	
C304	ECEA1CKA100	10	
C306	ECEA1AU221	220	
C308	ECUV1H103KBV	0.01	
C311	ECEA1CKA100	10	
C333	ECUV1H103KBV	0.01	
C341	ECUV1H102KBV	0.001	
C342	ECUV1H102KBV	0.001	
C344	ECUV1C104ZFV	0.1	
C345	ECUV1C104KBV	0.1	
C371	ECUV1C104ZFV	0.1	
C373	ECUV1H103KBV	0.01	
C383	ECUV1H103KBV	0.01	
C414	ECEA1CKA100	10	
C415	ECUV1A105ZFV	1	
C431	ECUV1H272KBV	0.0027	
C432	ECUV1C104KBV	0.1	
C440	ECUV1H100DCV	10p	S
C441	ECUV1A224KBV	0.22	
C442	ECUV1C683KBV	0.068	
C443	ECUV1H101JCV	100p	
C444	ECUV1C104KBV	0.1	
C445	ECEA1CKA100	10	
C448	ECUV1C473KBV	0.047	
C449	ECUV1C104KBV	0.1	
C451	ECUV1C473KBV	0.047	
C461	ECUV1C104ZFV	0.1	
C464	ECUV1H101JCV	100p	
C467	ECUV1H070CCV	7p	
C501	ECEA0JU102	1000	
C502	ECUV1C104ZFV	0.1	
C503	ECUV1C104ZFV	0.1	
C504	ECUV1C104ZFV	0.1	
C505	ECUV1C104ZFV	0.1	
C506	ECUV1H080CCV	8p	
C507	ECUV1H050CCV	5p	
C508	ECUV1H332KBV	0.0033	
C511	ECUV1H152KBV	0.0015	
C513	ECUV1C104ZFV	0.1	
C515	ECEA1CKS220	22	S
C516	ECUV1C104ZFV	0.1	
C521	ECEA1AU101	100	S
C522	ECUV1C104ZFV	0.1	
C525	ECUV1C104ZFV	0.1	
C526	ECUV1H332KBV	0.0033	
C551	ECUV1C104ZFV	0.1	
C601	ECEA1AU101	100	S
C603	ECUV1C104ZFV	0.1	
C611	ECEA1AU101	100	S
C613	ECEA1AU101	100	S
C614	ECUV1C104ZFV	0.1	
C621	ECEA1EU101	100	S
C631	ECUV1H103KBV	0.01	
C654	ECUV1C104ZFV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C657	ECUV1H680JCV	68p	
C663	ECUV1H680JCV	68p	
C665	ECUV1H680JCV	68p	
C741	ECUV1C104ZFV	0.1	
C751	ECUV1H100DCV	10p	S
C752	ECUV1H100DCV	10p	S
C753	ECUV1C104ZFV	0.1	
C760	ECUV1H070CCV	7p	
C761	ECUV1H070CCV	7p	
C763	ECUV1H070CCV	7p	
C764	ECUV1H070CCV	7p	

21.1.3. RF UNIT PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQLP10243Z	RF BLOCK	

21.2. Handset

21.2.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
101	PQAX2P07Z	SPEAKER	
102	PQBC10335Y2	NAVI KEY BUTTON	S
103	PQHE10119Z	CUSHION/ URETHANE FORM	
104	PQHG10620Z	PACKING RUBBER/ BATTERY	
105	PQHG10621Z	RINGER RUBBER	
106	PQHG10629Z	RUBBER/ BATTERY	
107	PQHG10630Z	PACKING RUBBER	
108	PQHR10739Z	SP HOLDER	
109	PQHR10861Z	LED LENS/ RUBBER	
110	PQHS10384Z	PACKING SHEET/ RINGER	
111	PQHS10386Z	PACKING SHEET/ MIC	
112	PQHS10461Z	PACKING SHEET, SPEAKER	
113	PQHS10484Z	PACKING SHEET/ EP CAP	
114	PQHS10485Z	CUSHION/ SPEAKER	
115	PQHX10934Z	SHEET	
116	PQHX10959Z	RF SPONGE	
117	PQJT10175Z	CHARGE TERMINAL	
118	PQKE10128Z1	E/P CAP	S
119	PQKE10129Z1	COVER	S
120	PQKF10514Z3	REAR CABINET	S
121	PQKK10117Z3	BATTERY COVER	S
122	PQYMTG2503SR	FRONT CABINET ASS´Y	
123	PQQT22245Z	CHARGE LABEL	
124	PQSA10120Z	ANTENNA	
125	PQSX10171Z	KEYBOARD SWITCH	
126	PQP510SVC	BATTERY	

21.2.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWPG2503CFR	MAIN P.C BOARD ASS´Y (RTL)	
		(ICS)	
IC201	C2HBBH000016	IC	
IC202	PQWIG2503CFR	IC	
IC203	PQVIC62FP33M	IC	S
IC204	PQVIXCP3302M	IC	S
IC205	PQVIC61CN32N	IC	S
		(TRANSISTORS)	
Q201	PQVTDTC143E	TRANSISTOR(SI)	S
Q204	2SA1797Q	TRANSISTOR(SI)	S
Q205	2SD1819A	TRANSISTOR(SI)	
Q206	PQVTDTC143E	TRANSISTOR(SI)	S
Q207	2SD1819A	TRANSISTOR(SI)	
Q208	PQVTD123T146	TRANSISTOR(SI)	S
Q209	PQVTD123T146	TRANSISTOR(SI)	S
Q210	UN521	TRANSISTOR(SI)	
Q211	PQVTDTA143TU	TRANSISTOR(SI)	
		(DIODES)	
D203	MA111	DIODE(SI)	
D212	MA8150	DIODE(SI)	
D213	MA8150	DIODE(SI)	
D214	PQVD1SR154	DIODE(SI)	S
D215	MA2ZD1400	DIODE(SI)	
D216	PQVD1SR154	DIODE(SI)	S
		(LEDS)	
LED201	PQVDSML310MT	LED	S
LED202	PQVDSML310MT	LED	S
LED203	PQVDSML310MT	LED	S
LED204	PQVDSML310MT	LED	S
LED205	PQVDSML310MT	LED	S
LED206	PQVDBR1111C	LED	S
		(COILS)	
L204	PQLQR3FL121	COIL	S
L205	PQLQR3FL121	COIL	S
		(CONNECTORS)	
CN202	PQJP2D13Z	CONNECTOR PIN	S
CN203	PQJJ1J007Z	EAR JACK	S
		(OTHERS)	
E101	PQJM146Y	MICROPHONE	
E102	PQEFBC12111B	RINGER	S
X201	PQVCI4096N3Z	CRYSTAL OSCILLATOR	
G1	PQJT10152Z	CHARGE TERMINAL	
G2	PQJT10152Z	CHARGE TERMINAL	
G3	PQJT10152Z	CHARGE TERMINAL	
G4	PQJT10152Z	CHARGE TERMINAL	
G5	PQJT10152Z	CHARGE TERMINAL	
G6	PQJT10152Z	CHARGE TERMINAL	
		(RESISTORS)	
R201	ERJ3GEYJ331	330	
R202	ERJ3GEYJ331	330	
R203	ERJ3GEYJ331	330	
R204	ERJ3GEYJ331	330	
R209	ERJ3GEYJ102	1k	
R210	ERJ3GEYJ104	100k	
R211	ERJ3GEYJ104	100k	
R212	ERJ3GEYJ101	100	
R213	ERJ3GEYJ101	100	
R220	ERJ3GEYJ474	470k	
R221	ERJ3GEYJ103	10k	
R222	ERJ3GEYJ101	100	
R223	ERJ3GEY0R00	0	
R224	ERJ3GEYJ103	10k	
R225	ERJ3GEYJ472	4.7k	
R226	ERJ3GEYJ103	10k	
R227	ERJ3GEYJ473	47k	
R228	ERJ3GEYJ224	220k	
R229	ERJ3GEYJ102	1k	
R230	ERJ3GEYJ102	1k	
R231	ERJ3GEYJ102	1k	
R232	ERJ3GEYJ103	10k	
R233	ERJ3GEY0R00	0	
R234	ERJ3EKF2204	2.2M	
R235	ERJ3EKF2204	2.2M	
R236	ERJ3GEYJ473	47k	
R241	ERJ3GEY0R00	0	
R242	ERJ3GEYJ180	18	
R243	ERJ3GEYJ180	18	
R244	ERJ3GEYJ473	47k	
R245	ERJ3GEYJ103	10k	
R246	ERJ3GEYJ153	15k	
R247	ERJ3GEYJ391	390	
R248	ERJ3GEYJ393	39k	
R249	ERJ3GEYJ222	2.2k	
R250	ERJ3GEYJ222	2.2k	
R251	ERJ3GEYJ120	12	
R252	ERJ3GEYJ820	82	
R253	ERJ3GEYJ222	2.2k	
R260	ERJ3GEYJ103	10k	
R263	ERJ3GEYJ104	100k	

Ref. No.	Part No.	Part Name & Description	Remarks
R264	ERJ3GEYJ103	10k	
R265	ERJ3GEYJ103	10k	
R266	ERJ3GEYJ105	1M	
R267	ERJ3GEYJ331	330	
R268	ERJ3GEYJ681	680	
R270	ERJ3GEYJ104	100k	
R273	ERJ3GEY0R00	0	
R274	ERJ3GEY0R00	0	
R275	ERJ3GEY0R00	0	
R277	ERJ3GEY0R00	0	
		(CAPACITORS)	
C203	ECUV1C104ZFV	0.1	
C205	ECUV1H101JCV	100p	
C213	ECEV1AA221	220	
C214	ECUV1H103KBV	0.01	
C217	ECUV1C104ZFV	0.1	
C218	ECUV1C104ZFV	0.1	
C219	ECUV1H470JCV	47p	
C220	ECEV0JA101	100	
C221	ECUV1C104ZFV	0.1	
C222	ECUV1C104ZFV	0.1	
C223	ECST0JY106	10	
C224	ECUV1C104ZFV	0.1	
C226	ECUV1C104ZFV	0.1	
C227	ECUV1H470JCV	47p	
C228	ECUV1C104ZFV	0.1	
C229	ECUV1C104ZFV	0.1	
C230	ECUV1C104KBV	0.1	
C231	ECUV1A224KBV	0.22	
C232	ECUV1C104KBV	0.1	
C233	ECUV1C104ZFV	0.1	
C234	ECUV1A224KBV	0.22	
C236	ECUV1H060DCV	6p	S
C237	ECUV1H060DCV	6p	S
C239	ECUV1H103KBV	0.01	
C249	ECST0GY226	22	
C255	ECUV1A224KBV	0.22	
C267	ECST0JY226	22	
C270	ECST0JY475	4.7	
C274	ECUV1C104ZFV	0.1	
C280	ECUV1C104ZFV	0.1	
C283	ECUV1A105ZFV	1	
C290	ECUV1H102KBV	0.001	
C291	ECUV1H102KBV	0.001	
C294	ECUV1H103KBV	0.01	
C296	ECUV1C104ZFV	0.1	

21.2.3. RF UNIT PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB200	PQLP10244Z	RF BLOCK	

21.3. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQJA10075Z	TEL CORD	
A2	PQKE10127Z1	BELT CLIP	S
A3	PQKL10038Y3	WALL MOUNT ADAPTOR	S
A4	PQLV1Z	AC ADAPTOR	⚠
A5	PQQX12985Z	INSTRUCTION BOOK (for English)	
A6	PQQX12986Z	INSTRUCTION BOOK (for French)	
A7	PQQT11564Z	TEL CORD LABEL	
P1	PQPK13347Z	GIFT BOX	
P2	XZB10X35A02	PROTECTION COVER (for Handset)	
P3	XZB21X35A03	PROTECTION COVER (for Base)	

22 FOR SCHEMATIC DIAGRAM

22.1. Base Unit (SCHEMATIC DIAGRAM (Base Unit))

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

> Important Safety Notice:
> Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

This schematic diagram may be modified at any time with the development of new technology.

22.2. Handset (SCHEMATIC DIAGRAM (Handset))

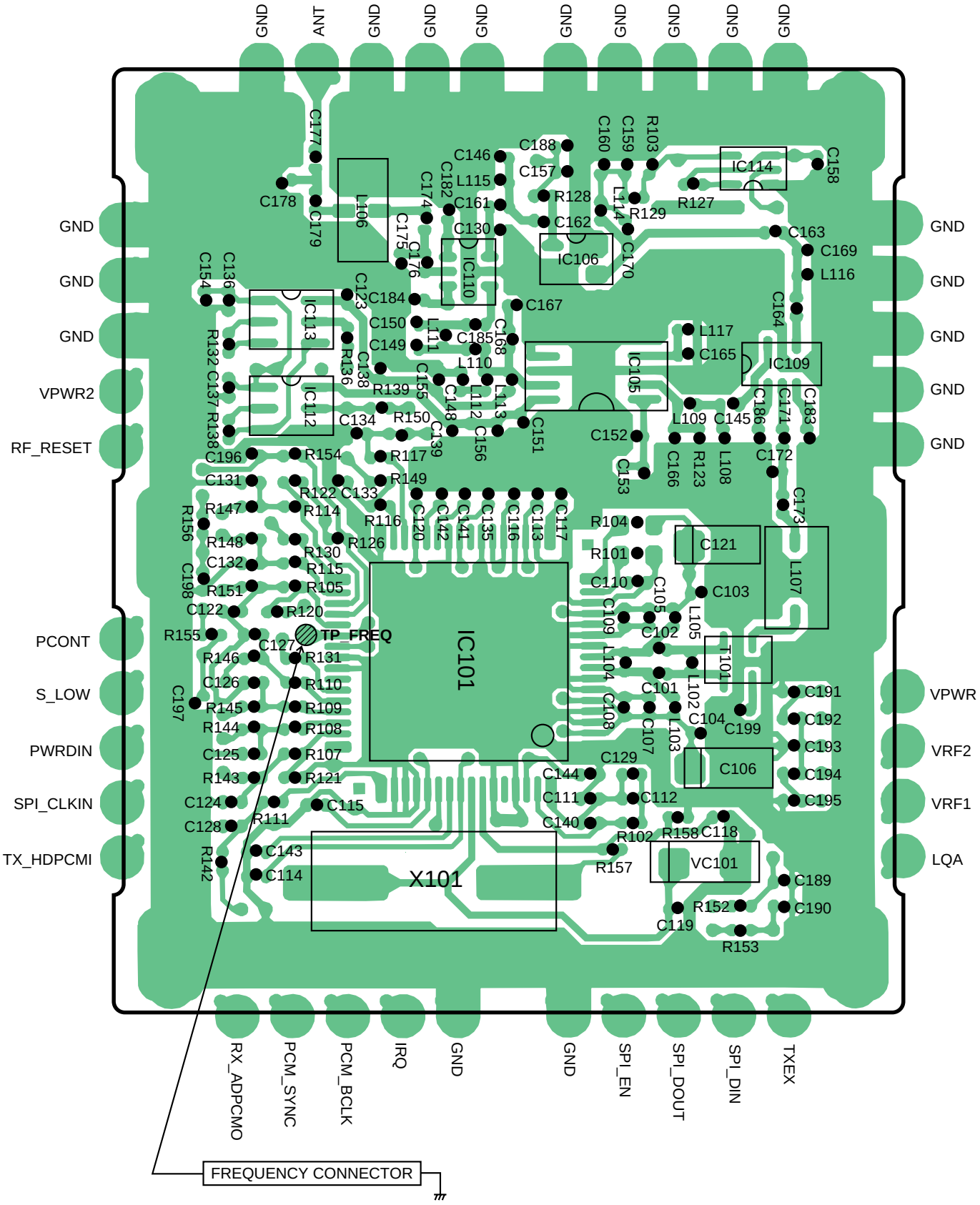
Notes:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.

22.3. MEMO

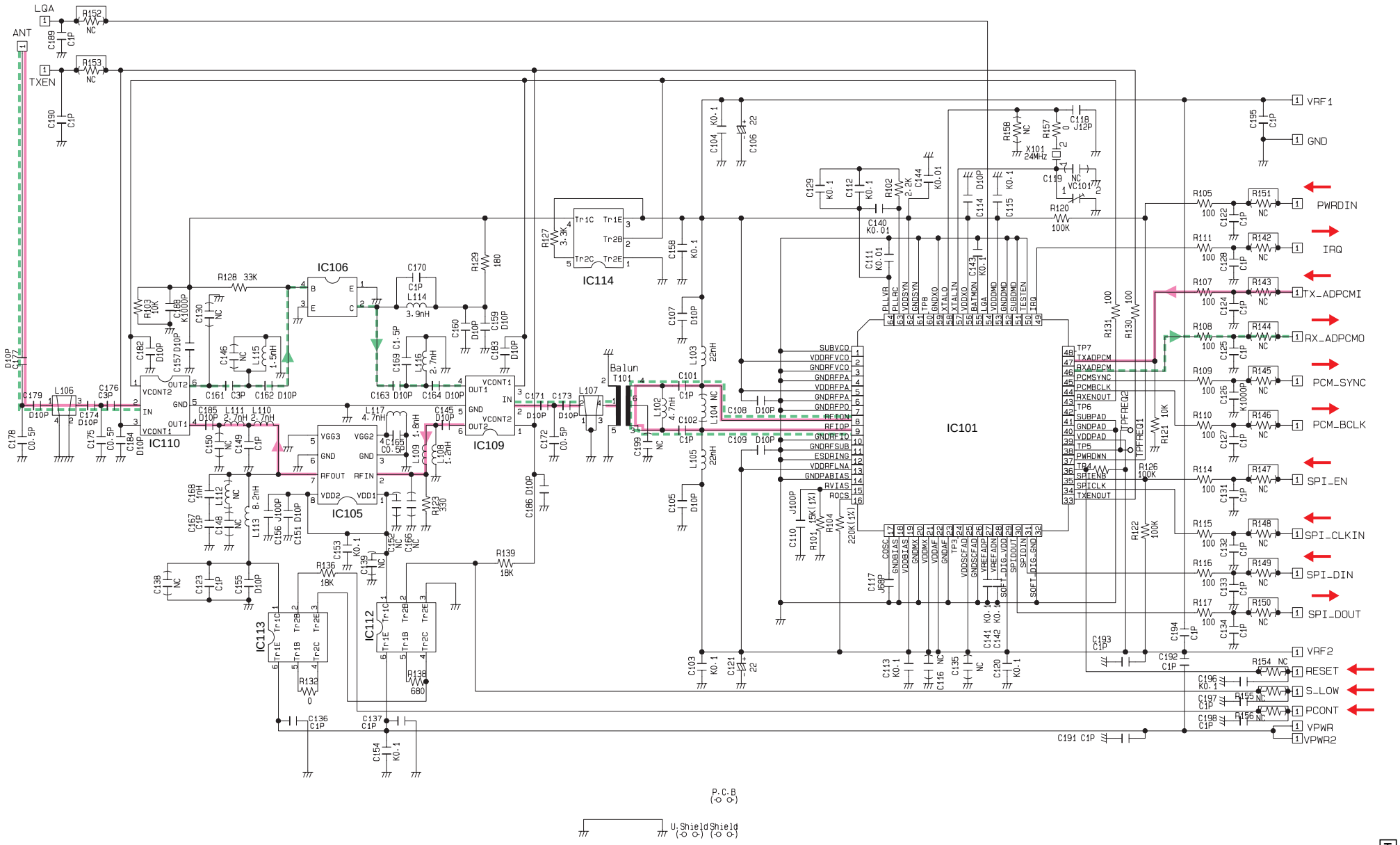
23 CIRCUIT BOARD (RF Unit)

23.1. RF Unit Reference Drawing (Base Unit and Handset)



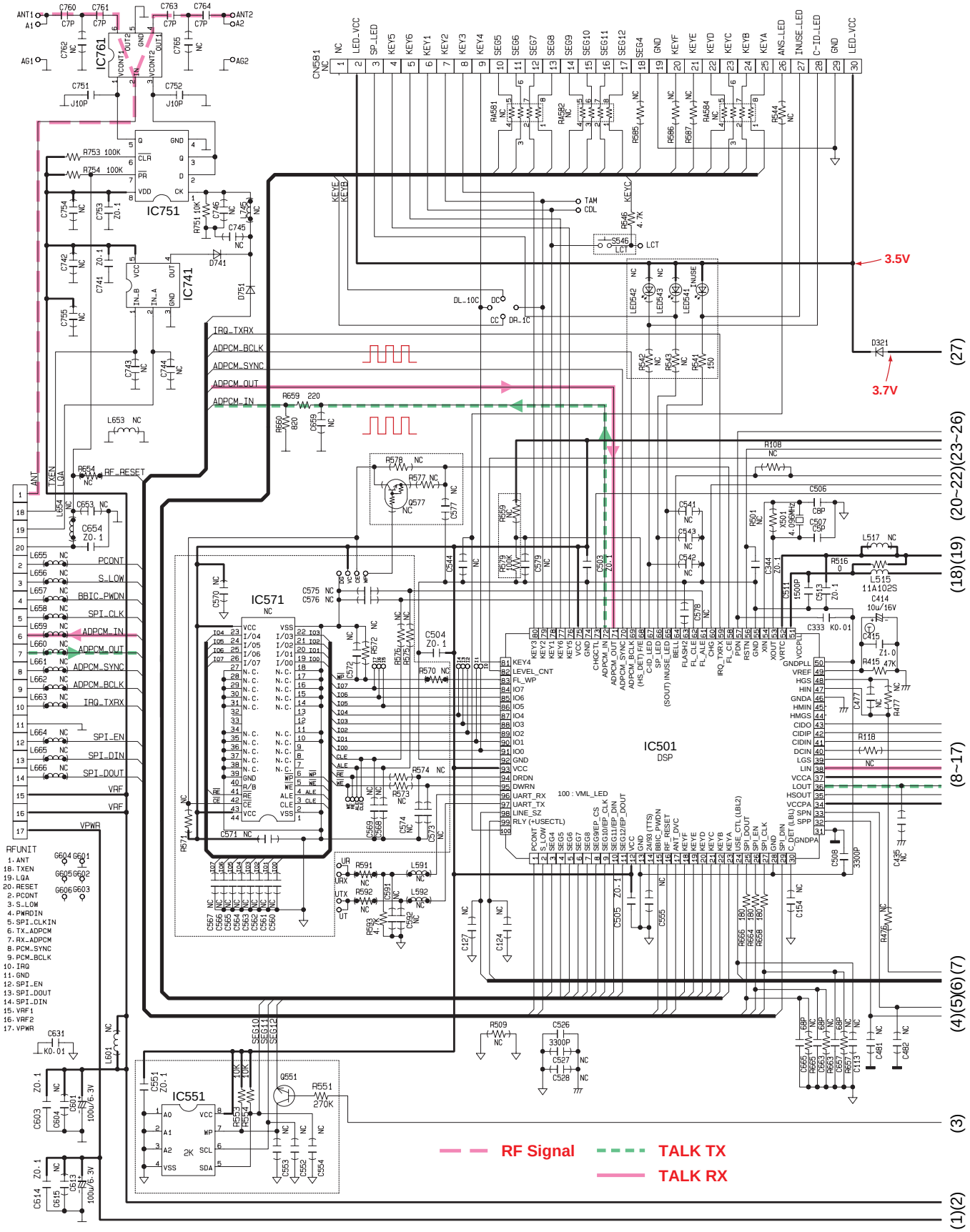
24 SCHEMATIC DIAGRAM (RF UNIT)

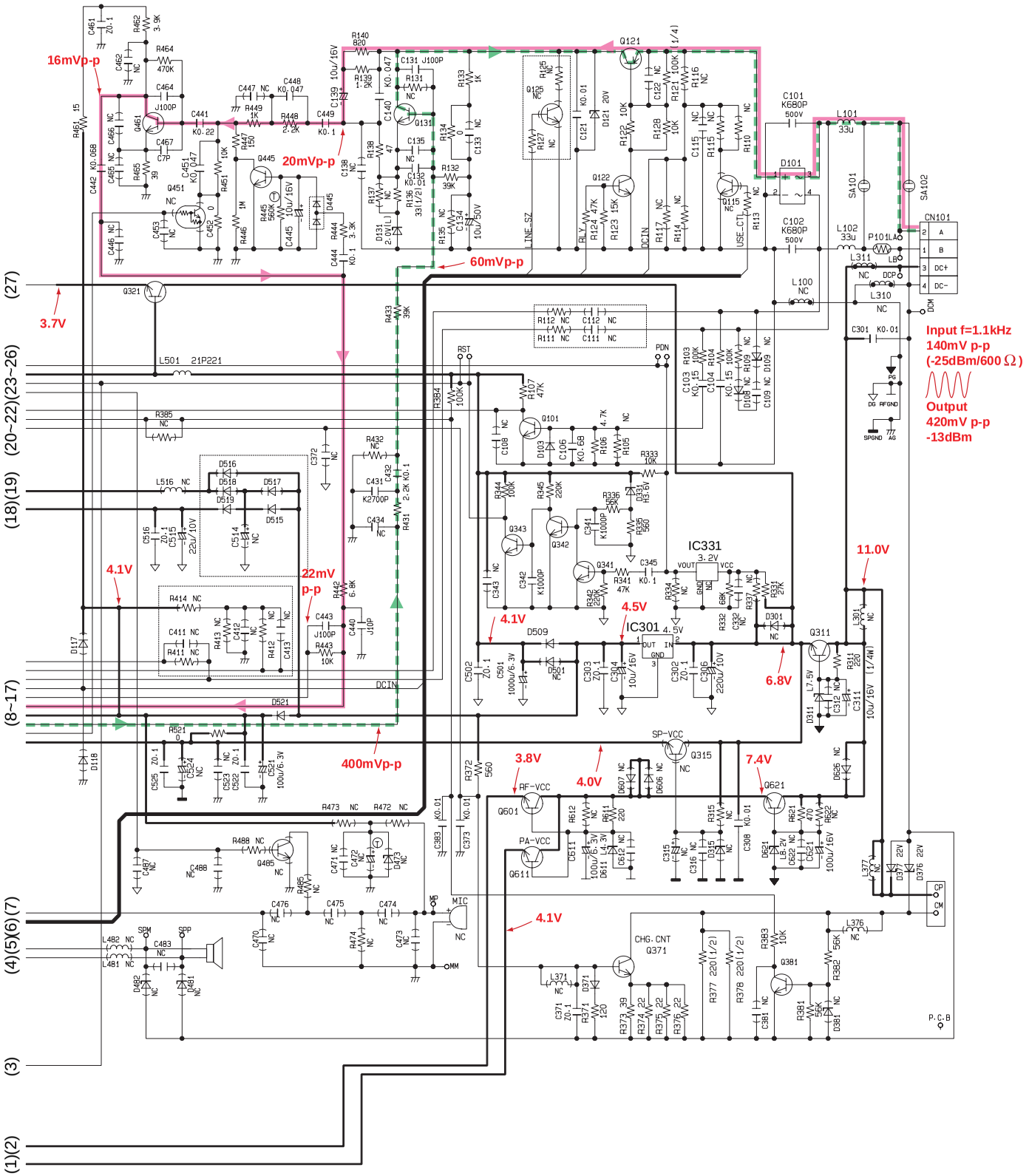
24.1. Base Unit and Handset



25 SCHEMATIC DIAGRAM (Base Unit)

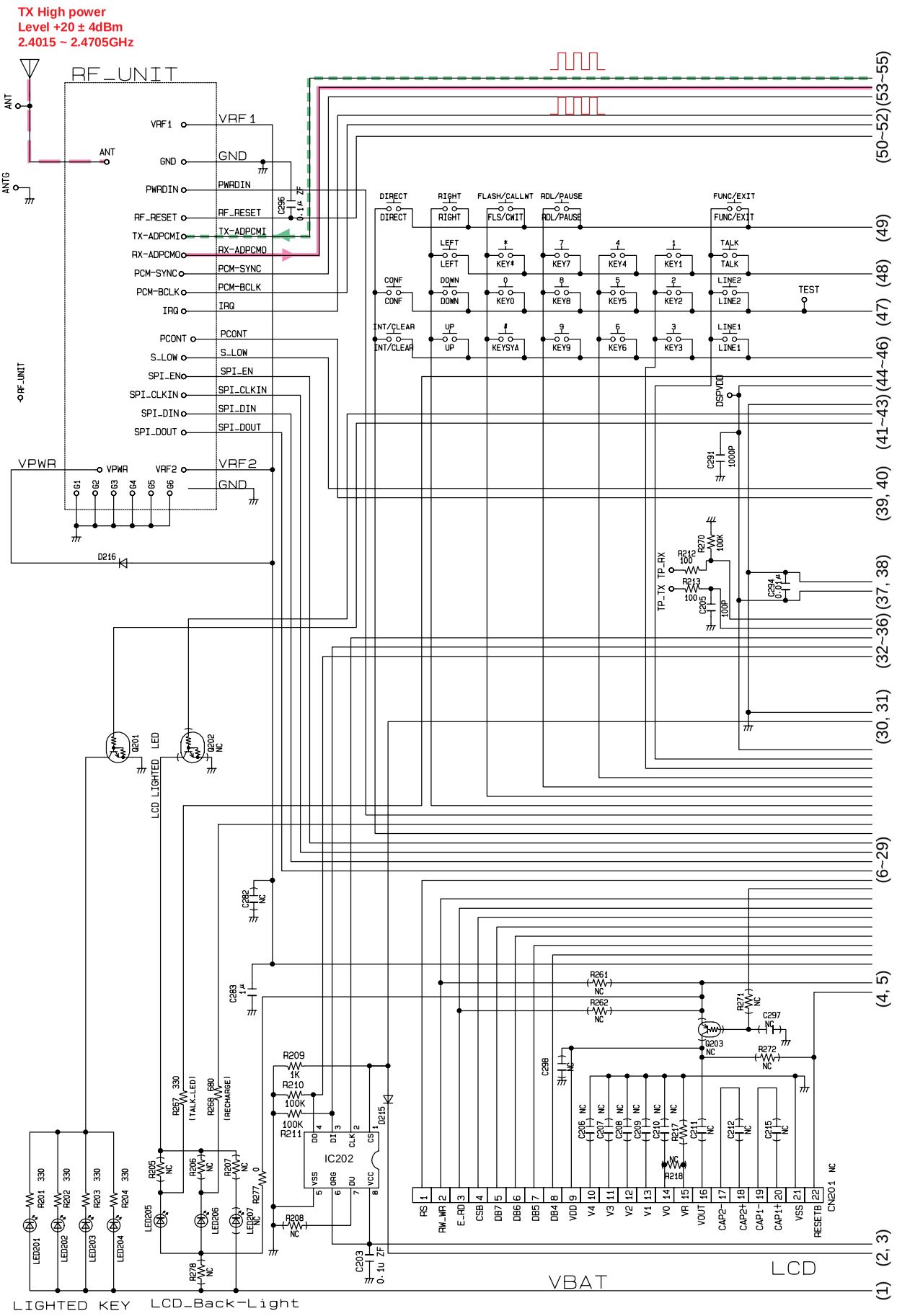
TX High power
Level +20 ± 4dBm
2.4540 ~ 2.4720GHz

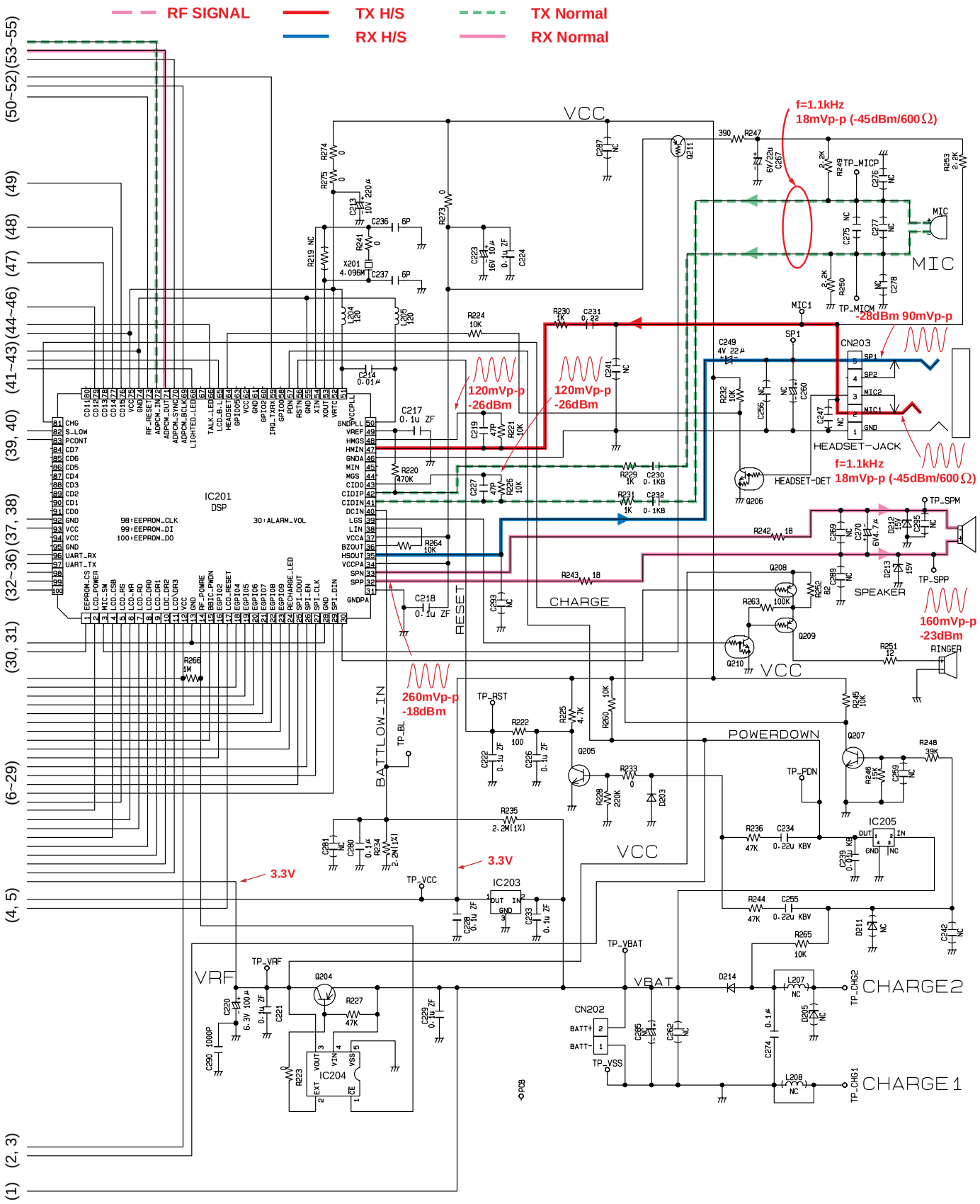




KX-TG2503CF: SCHEMATIC DIAGRAM (Base Unit)

26 SCHEMATIC DIAGRAM (Handset)

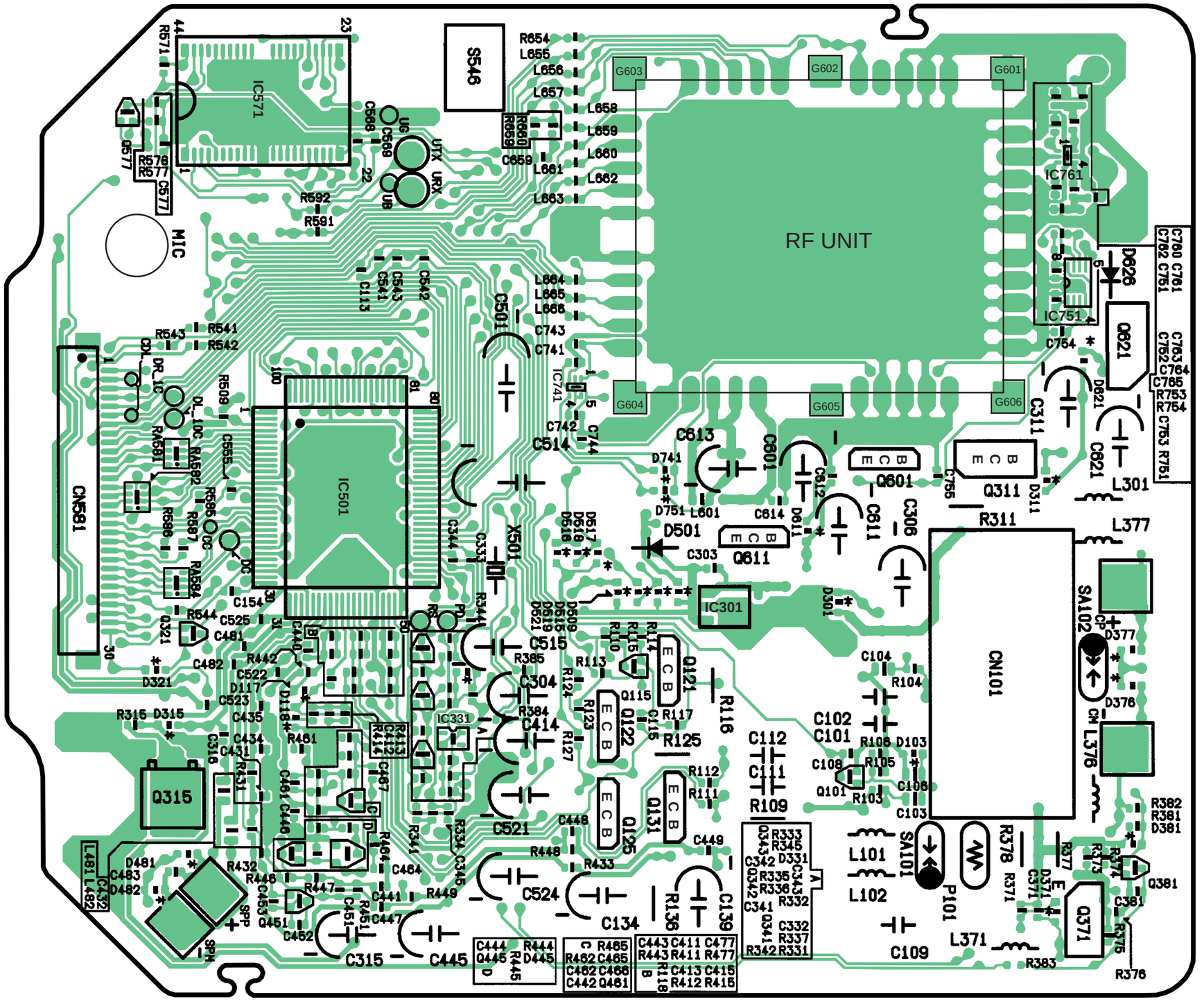




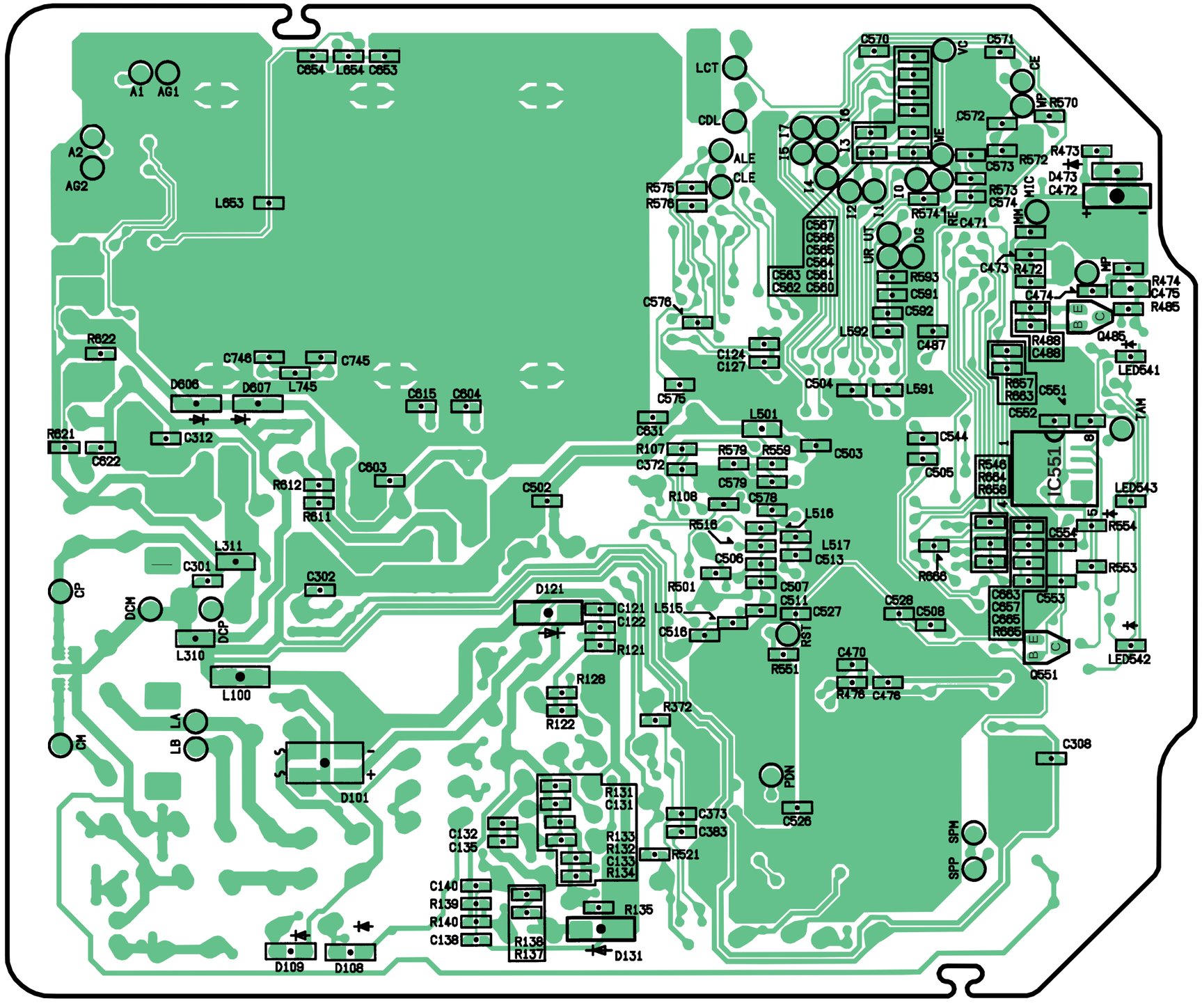
KX-TG2503CF: SCHEMATIC DIAGRAM (Handset)

27 CIRCUIT BOARD (Base Unit)

27.1. Component View

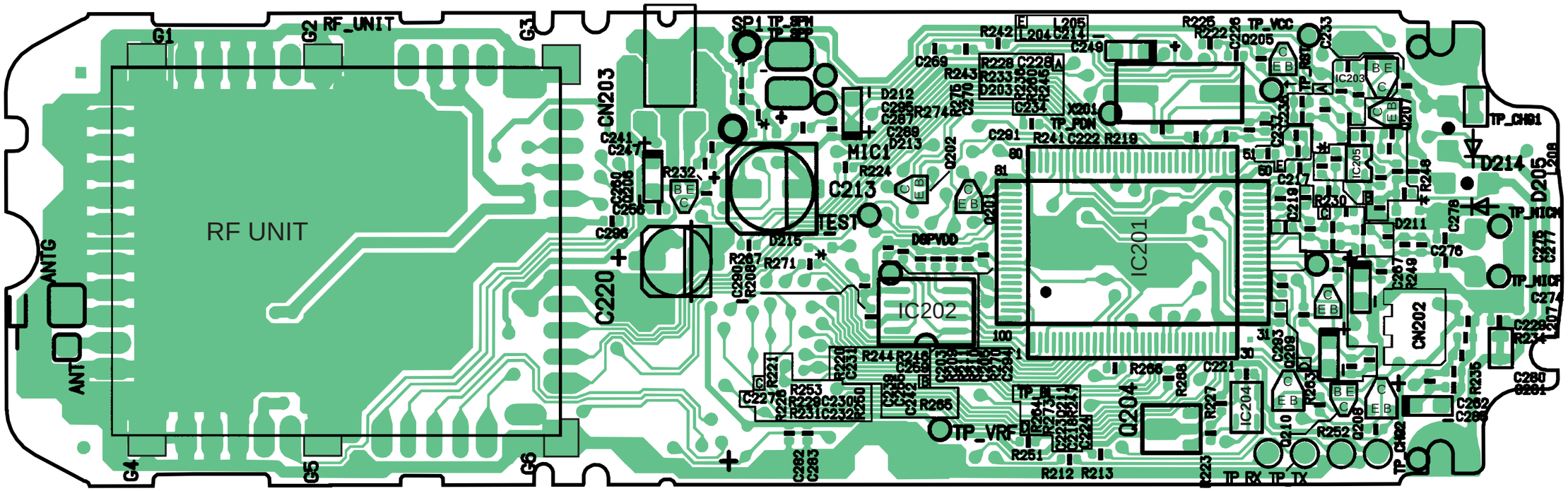


27.2. Flow Solder Side View

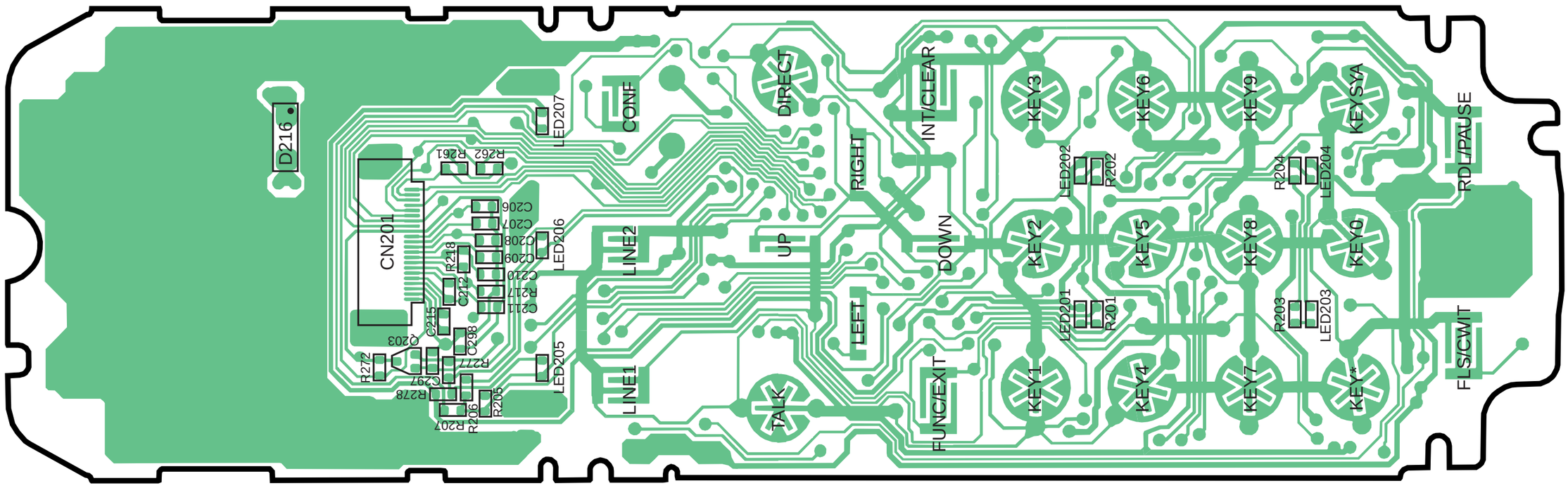


28 CIRCUIT BOARD (Handset)

28.1. Component View



28.2. Flow Solder Side View



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